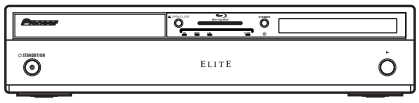
Pioneer *sound.vision.soul*

Service Manual



BDP-HD1

ORDER NO.
RRV3466

Blu-ray Disc PLAYER

BDP-HD1

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Model	Type	Power Requirement	Region No.	Remarks
BDP-HD1	KU/CA	AC120 V	1 BD Region A	

For details, refer to "Important symbols for good services".

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

T-ZZR DEC. 2006 printed in Japan

SAFETY INFORMATION

This service manual is intended for qualified service technicians ; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to causecancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

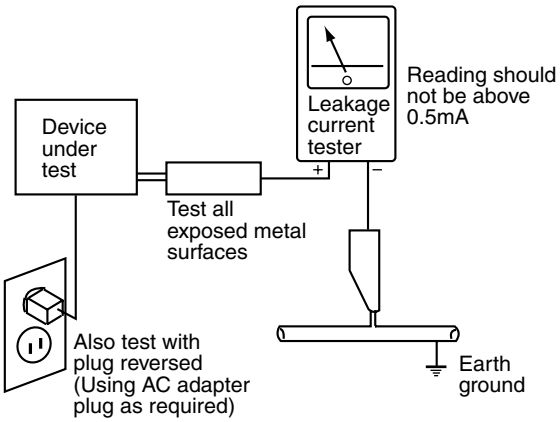
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (waterpipe , conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

CAUTION
This product is a class 1 laser product, but this product contains a laser diode higher than Class 1.
To ensure continued safety, do not remove any covers or attempt to gain access to the inside of the product.
Refer all servicing to qualified personnel.

CLASS 1 LASER PRODUCT
APPAREIL Á LASER DE CLASSE 1

The following caution label appears on your unit.
Location: inside of the unit

CAUTION	CLASS 3B LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO THE BEAM.
ATTENTION	RADIATIONS LASER DE CLASSE 3B QUAND OUVERT. ÉVITEZ TOUT EXPOSITION AU FAISCEAU.
ADVARSEL	KLASSE 3B LASERSTRÅLING VED ÅBNING. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARNING	KLASS 3B LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. UNDVIK ATT UTSÄTTA DIG FÖR STRÅLEN.
VORSICHT	BEI GEÖFFNETER ABDECKUNG IST LASERSTRAHLUNG DER KLASSE 3B IM GERÄTEINNEREN VORHANDEN. AUGEN NICHT DEM LASERSTRAHL AUSSETZEN!
PRECAUCIÓN	CUANDO SE ABRE HAY RADIACIÓN LÁSER DE CLASE 3B. EVITE LA EXPOSICIÓN A LOS RAYOS LÁSER.
VARO!	AVATTAESSA ALTISTUT LUOKAN 3B LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
注意	ここを開くと CLASS 3B の レーザ光が出ます。ビームを直接見たり、触れたりしないこと。

DRW2277-A

WARNING !

THE AEL (ACCESSIBLE EMISSION LEVEL) OF THE LASER POWER OUTPUT IS LESS THAN **CLASS 1** BUT THE LASER COMPONENT IS CAPABLE OF EMITTING RADIATION EXCEEDING THE LIMIT FOR **CLASS 1**.
A SPECIALLY INSTRUCTED PERSON SHOULD DO SERVICING OPERATION OF THE APPARATUS.

LABEL CHECK

LASER DIODE CHARACTERISTICS

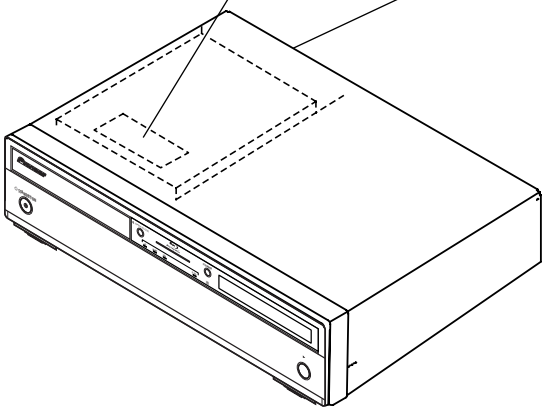
FOR DVD : MAXIMUM OUTPUT POWER : 5 mW
WAVELENGTH : 650 nm
FOR CD : MAXIMUM OUTPUT POWER : 7 mW
WAVELENGTH : 780 nm

CAUTION	CLASS 3B LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO THE BEAM.
ATTENTION	RADIATIONS LASER DE CLASSE 3B QUAND OUVERT. ÉVITEZ TOUT EXPOSITION AU FAISCEAU.
ADVARSEL	KLASSE 3B LASERSTRÅLING VED ÅBNING. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARNING	KLASS 3B LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. UNDVIK ATT UTSÄTTA DIG FÖR STRÅLEN.
VORSICHT	BEI GEÖFFNETER ABDECKUNG IST LASERSTRAHLUNG DER KLASSE 3B IM GERÄTEINNEREN VORHANDEN. AUGEN NICHT DEM LASERSTRAHL AUSSETZEN!
PRECAUCIÓN	CUANDO SE ABRE HAY RADIACIÓN LÁSER DE CLASE 3B. EVITE LA EXPOSICIÓN A LOS RAYOS LÁSER.
VARO!	AVATTAESSA ALTISTUT LUOKAN 3B LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
注意	ここを開くと CLASS 3B の レーザ光が出ます。ビームを直接見たり、触れたりしないこと。

DRW2277-A

(Printed on the Rear Panel)

CLASS 1 LASER PRODUCT
APPAREIL A LASER DE CLASSE 1



[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

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1. SPECIFICATIONS

Specifications

General

System . . . . . BD Player
(BD-ROM, DVD-Video, DVD-R/RW, network file playback)

Power requirements . . . . . AC 120 V, 60 Hz
Power consumption . . . . . 39 W
Power consumption (standby) . . . . . 0.5 W
Weight . . . . . 6.3 kg (13 lb 15 oz)
Dimensions . . . . . 420 mm (W) x 94 mm (H) x 359 mm (D)
(16 9/16 in. (W) x 4 5/8 in. (H) x 14 3/16 in. (D))
Operating temperature . . . . . +5 °C to +35 °C
Operating humidity . . . . . 5 % to 85 %
(no condensation)

HDMI output

HDMI output . . . . . 19 pin

Component Video output (Y, PB, PR)

Output level . . . . . Y: 1.0 Vp-p (75 Ω)
PB, PR: 0.7 Vp-p (75 Ω)
Jacks . . . . . RCA jacks

S-Video output

Y (luminance) - Output level . . . . . 1 Vp-p (75 Ω)
C (color) - Output level . . . . . 286 mVp-p (75 Ω)
Jack . . . . . S-Video jack

Video output

Output level . . . . . 1 Vp-p (75 Ω)
Jack . . . . . RCA jack

Audio output (1 stereo pair)

Output level . . . . . During audio output
200 mVrms (1 kHz, –20 dB)
Number of channels 2
Jacks . . . . . RCA jack

Audio output (multi-channel / L, R, C, SW, LS, RS)

Output level . . . . . During audio output
200 mVrms (1 kHz, –20 dB)
Number of channels 6
Jacks . . . . . RCA jack

Audio characteristics

Frequency response . . . . . 4 Hz to 22 kHz

S/N ratio . . . . . 114 dB
Dynamic range . . . . . 102.5 dB
Total harmonic distortion . . . . . 0.001 %
Wow and flutter . . . . . Limit of measurement
(0.001 % W. PEAK) or lower

Digital output

Optical digital output . . . . . Optical digital jack
Coaxial digital output . . . . . RCA jack

Other terminals

LAN terminal . . . . . Ethernet jack
10 BASE-T/100 BASE-TX
Control in . . . . . Minijack (3.5 ø)
IR in . . . . . Minijack (3.5 ø)

Accessories

Stereo audio cable 1
Video cable 1
Power cable 1
Remote control 1
AA/LR6 batteries 2
Warranty card 1
These operating instructions

The specifications and design of this product are subject to change without notice.

A

B

C

D

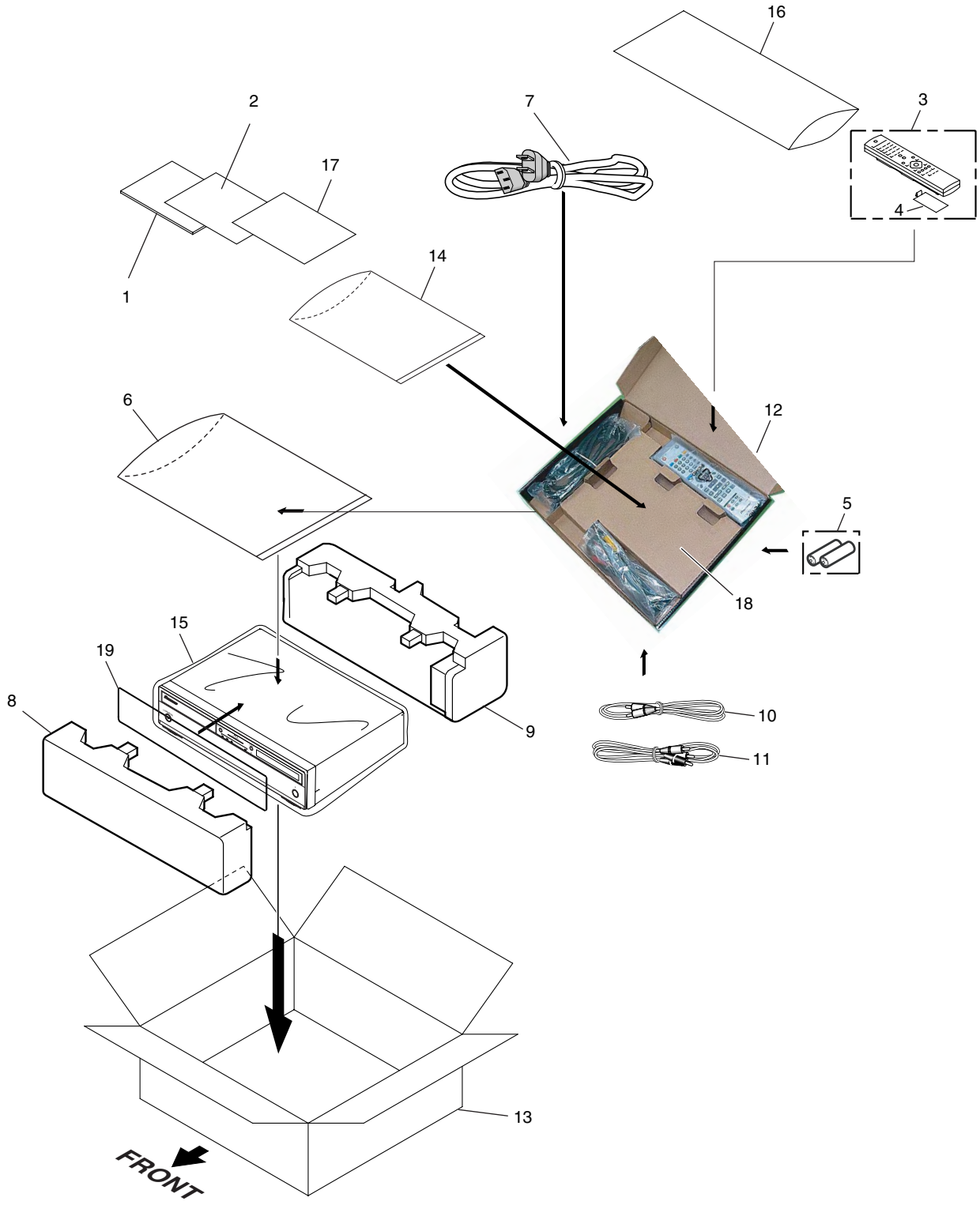
E

F

2. EXPLODED VIEWS AND PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Screws adjacent to ▼ mark on product are used for disassembly.*
- *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions, apply as you think it appropriate.)*

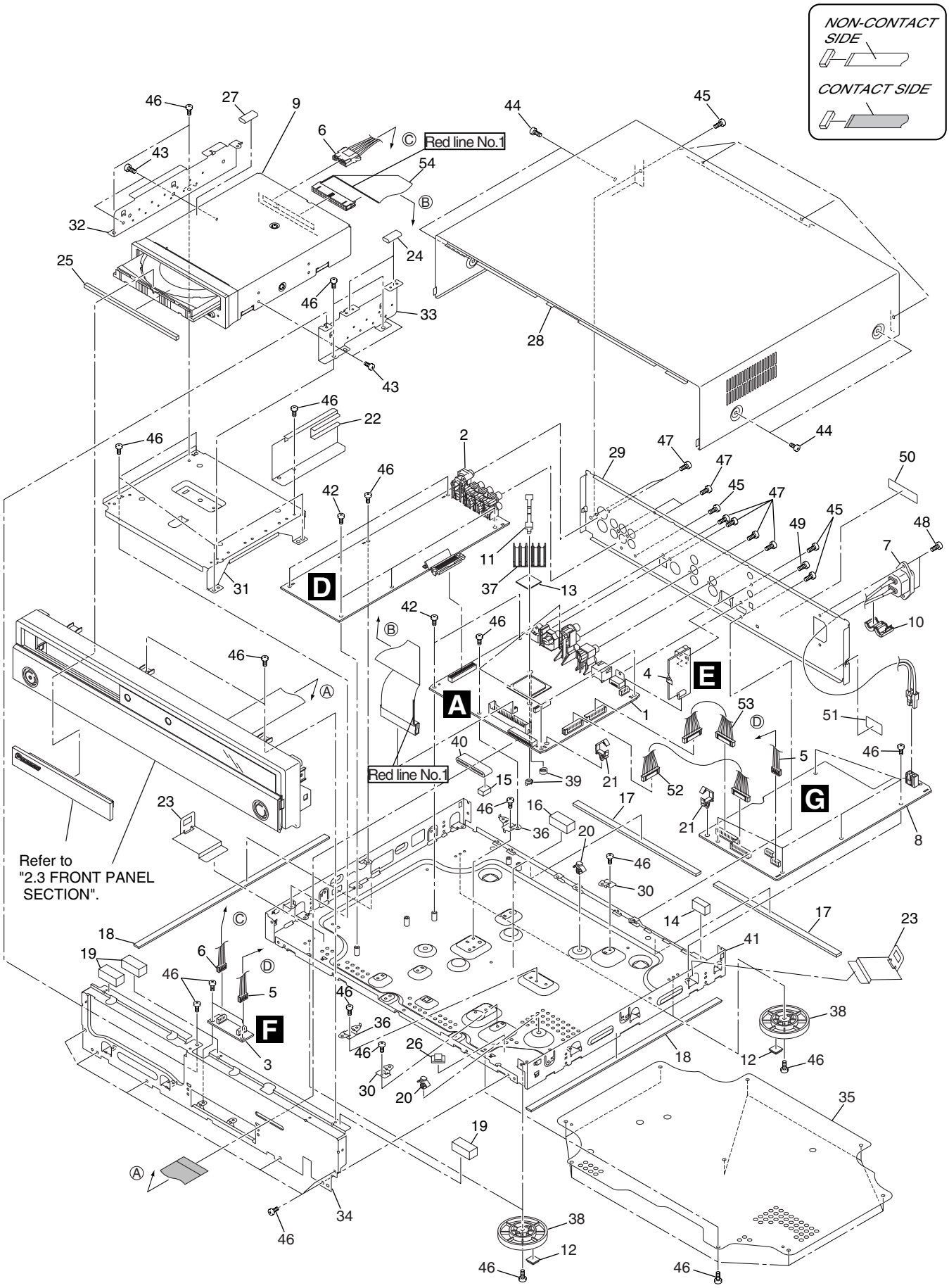
2.1 PACKING



PACKING parts List

Mark	No.	Description	Part No.
	1	Instruction Manual (English, French)	VRB1410
NSP	2	Warranty Card	ARY1026
	3	Remote Control Unit	VXX3101
	4	Battery Cover	AZN7933
NSP	5	Bettery (R6P, AA)	AEX1025
	6	Nonwoven Fabric Bag	VHL1108
⚠	7	AC Power Cord	ADG7061
	8	FRONT Pad (PS)	VHA1411
	9	REAR Pad (PS)	VHA1412
	10	Video cable	VDE1065
	11	Stereo audio cable	VDE1064
	12	Accessory Box	VHC1169
	13	Packing Case	VHG2711
NSP	14	Polyethylene Bag(230x340)	Z21-038
	15	Mirror Sheet	VHL1006
	16	Polyethylene Bag	VHL1051
	17	User Card	ARY1176
	18	Patation Plate (Paper)	VHC1170
	19	Nonwoven Cloth Cover	VHL1116

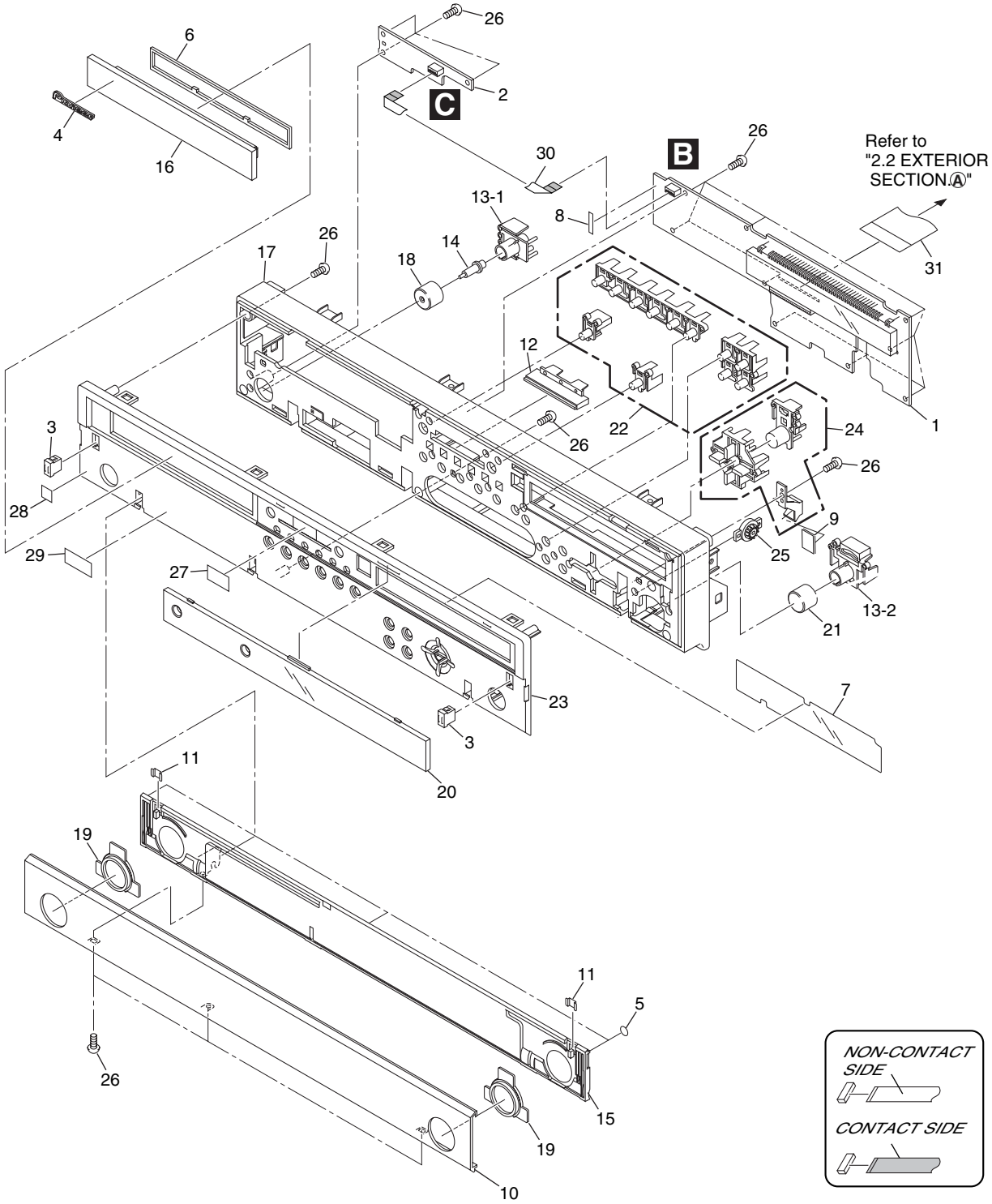
2.2 EXTERIOR SECTION



EXTERIOR SECTION parts List

Mark	No.	Description	Part No.
	1	MAIN ASSY	VXX3151
	2	AUJB ASSY	VWG2578
	3	WRPB ASSY	VWG2591
	4	SRJB ASSY	VWG2579
	5	Housing ASSY (4P)	VKP2388
	6	Housing ASSY (4P)	VKP2387
⚠	7	AC Inlet ASSY	ADX7523
⚠	8	SYPS ASSY	VWR1402
	9	Drive ASSY BDR101A	VXX3148
	10	Filter	CTX1054
	11	Hold Spring	VBK1168
	12	Rubber Foot	VEB1349
	13	Radiation Sheet	VEB1360
	14	SYPS Rubber	VEB1386
	15	Rubber Spacer1	VEB1387
	16	Rubber Spacer2	VEB1388
	17	Spacer S	VEB1392
	18	Spacer R	VEB1393
	19	Cushion	VEB1395
	20	Card Spacer	VEC1708
NSP	21	Clamp	VEC2418
	22	Styling Sheet	VEC2527
	23	Barrier	VEC2526
	24	Gasket	VEC2528
	25	Front Cushion	VEC2538
	26	Small Clamp	VEC2541
	27	Gasket	VEC2552
	28	Bonnet Case S	VXX3053
	29	Rear Panel	VNA2867
NSP	30	PCB Base	VNE2378
NSP	31	Sub Chassis	VNE2389
NSP	32	Writer Stay L	VNE2390
NSP	33	Writer Stay R	VNE2391
NSP	34	Front Stay	VNE2393
NSP	35	Layer Plate	VNE2394
NSP	36	PCB Stay	VNE2399
	37	Heatsink	VNH1078
	38	Insulator	VNK5794
	39	Stopper	VNK6140
	40	Ferrite Core	VTX1002
NSP	41	Base Chassis ASSY	VXA2743
	42	Screw	AMZ30P060FTC
	43	Screw	AMZ30P060FTC
	44	Screw	BBZ30P060FBN
	45	Screw	BBZ30P060FCC
	46	Screw	BBZ30P060FTC
	47	Screw	BPZ30P080FCC
	48	Screw	CBZ30P080FCC
	49	Screw	PCZ30P060FCC
NSP	50	Serial Label S	VRW2017
NSP	51	ID Label ASSY	VXW1013
	52	Connector ASSY	PF12PP6D22
	53	Connector ASSY	PF13PP-D25
	54	Housing ASSY (ATA)	VKP2384
		Service AUSR ASSY	VXX3152
NSP		1..AUSR ASSY	VWM2394
		2..AUJB ASSY	VWG2578
		2..WRPB ASSY	VWG2591
		2..SRJB ASSY	VWG2579

2.3 FRONT PANEL SECTION

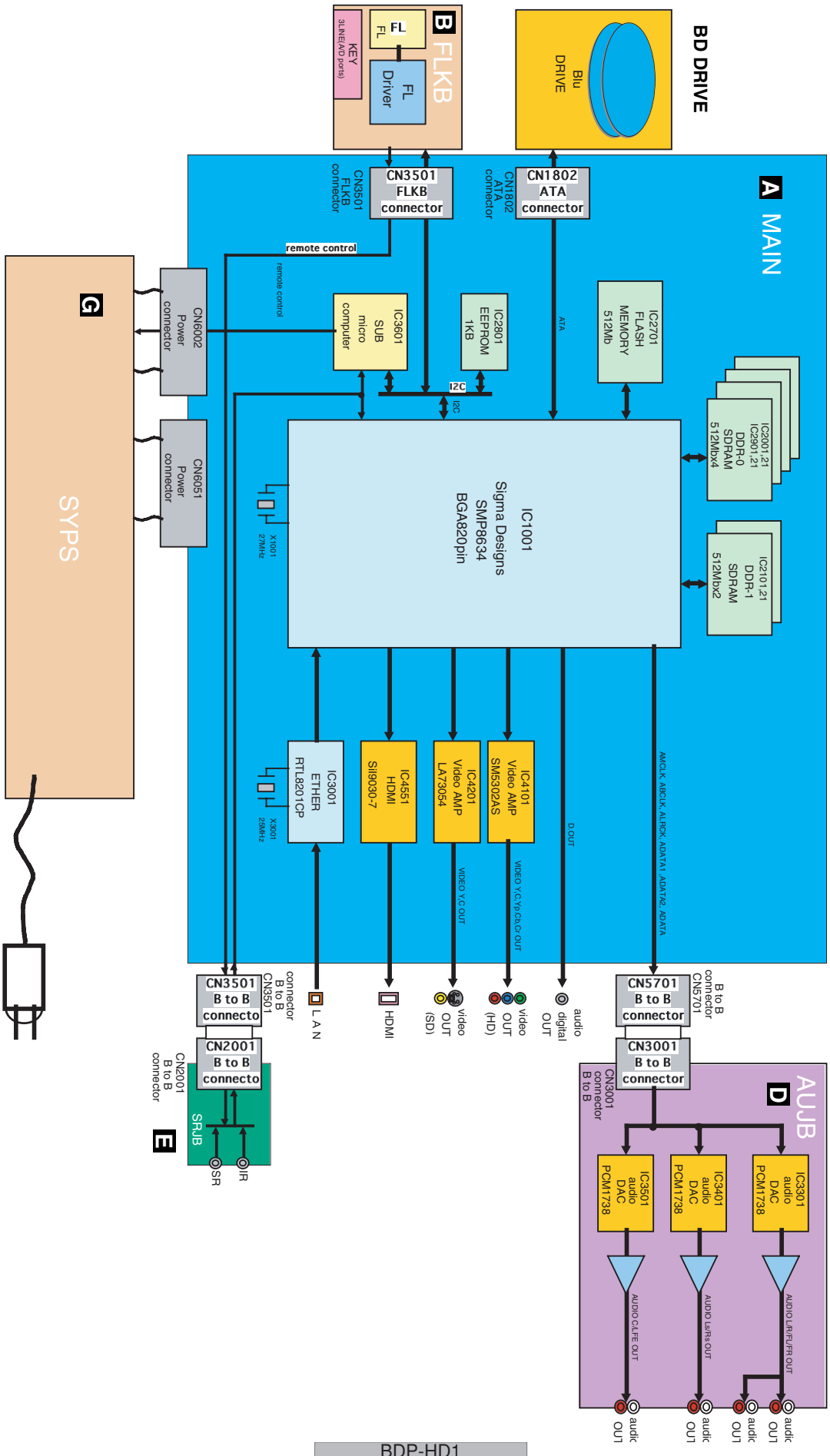


FRONT PANEL SECTION parts List

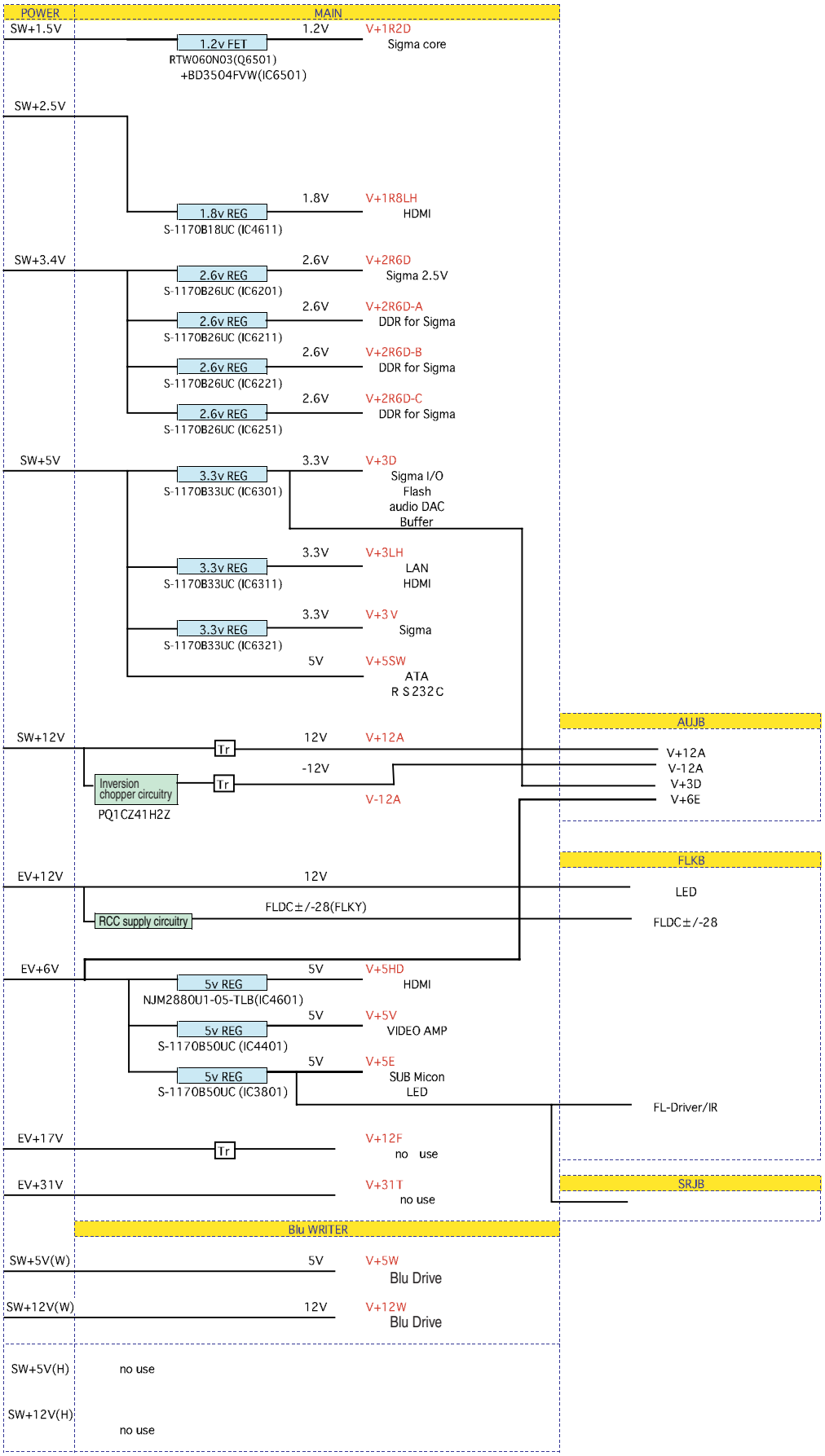
Mark	No.	Description	Part No.
	1	FLKY ASSY	VWG2559
	2	PSWB ASSY	VWG2560
	3	Magnet Holder ASSY	AEC1077
	4	Name Plate B	PAN1376
	5	Rubber Sheet	VEB1372
	6	Tray Sheet	VEC2502
	7	FL Filter	VEC2534
	8	Spacer	VEC2543
	9	Damper Spacer	VEC2546
	10	Door Panel B	VNB1054
	11	Magnet Catcher	VNE2388
	12	Illumi Lens A	VNK5783
	13	Power Key 1	VNK5790
	14	LED Lens	VNK5792
	15	Door Base	VNK5918
	16	Tray Panel	VNK5920
	17	Panel Base	VNK5945
	18	Key Top	VNK5946
	19	Door Ring	VNK5947
	20	FL Lens	VNK5948
	21	Key Top A	VNK5949
	22	Main Key	VNK5997
	23	Front Panel	VNK6015
	24	Menu Key	VNK6089
	25	Damper ASSY	VXA2504
	26	Screw	BPZ30P080FBN
	27	Hologram Label	VRW2264
NSP	28	Energy Star Label	AAX8022
NSP	29	Pop Label	VRW2329
	30	Flexible Cable (6P)	VDA2071
	31	Flexible Cable (28P)	VDA2152
		Service FLKB ASSY	VXX3153
NSP		1..FLKB ASSY	VWM2357
		2..FLKY ASSY	VWG2559
		2..PSWB ASSY	VWG2560

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

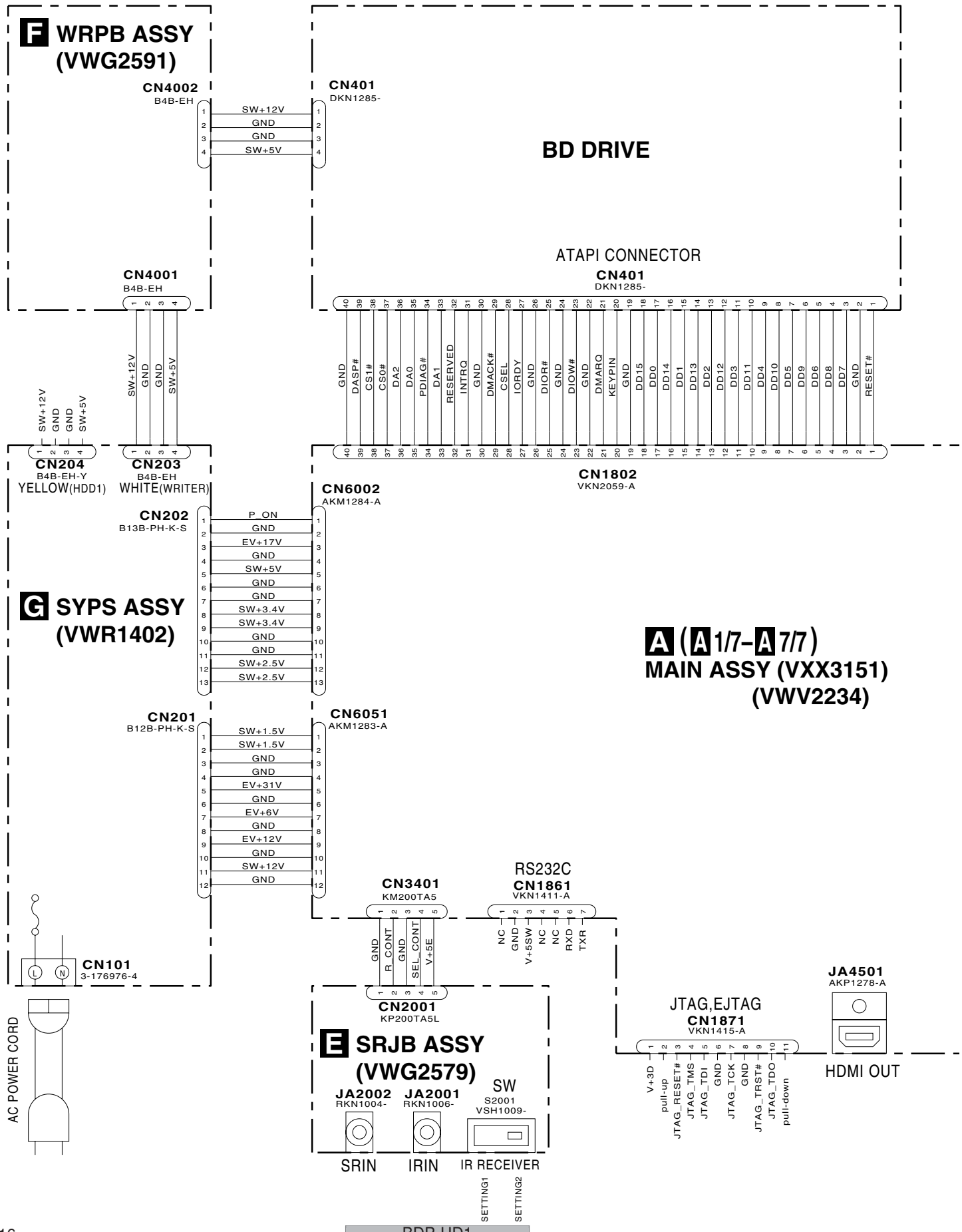
3.1 BLOCK DIAGRAM

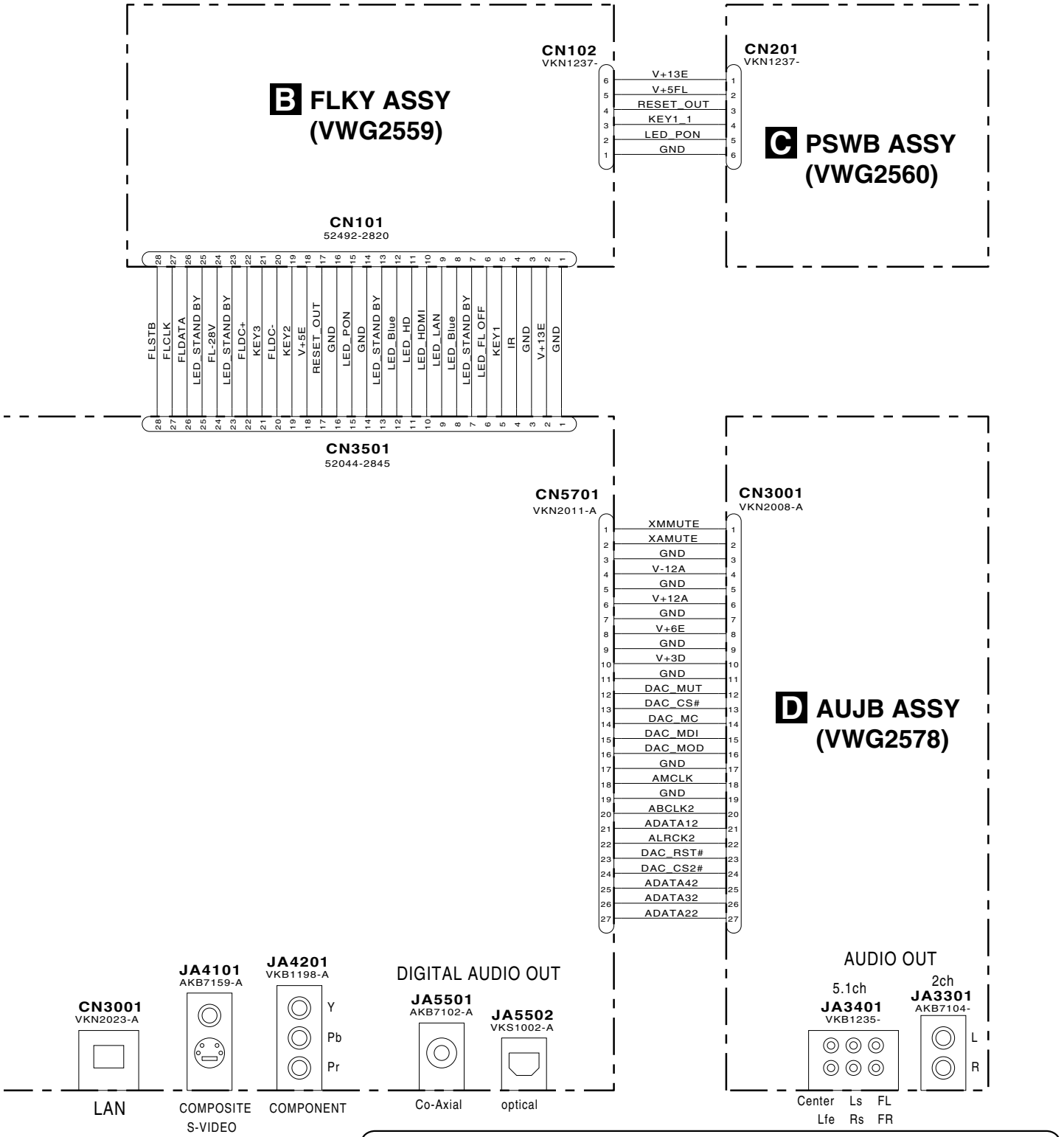


3.2 POWER BLOCK



3.3 OVERALL WIRING DIAGRAM

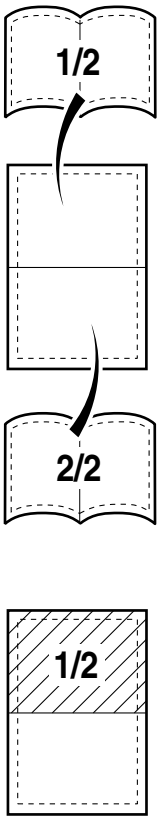


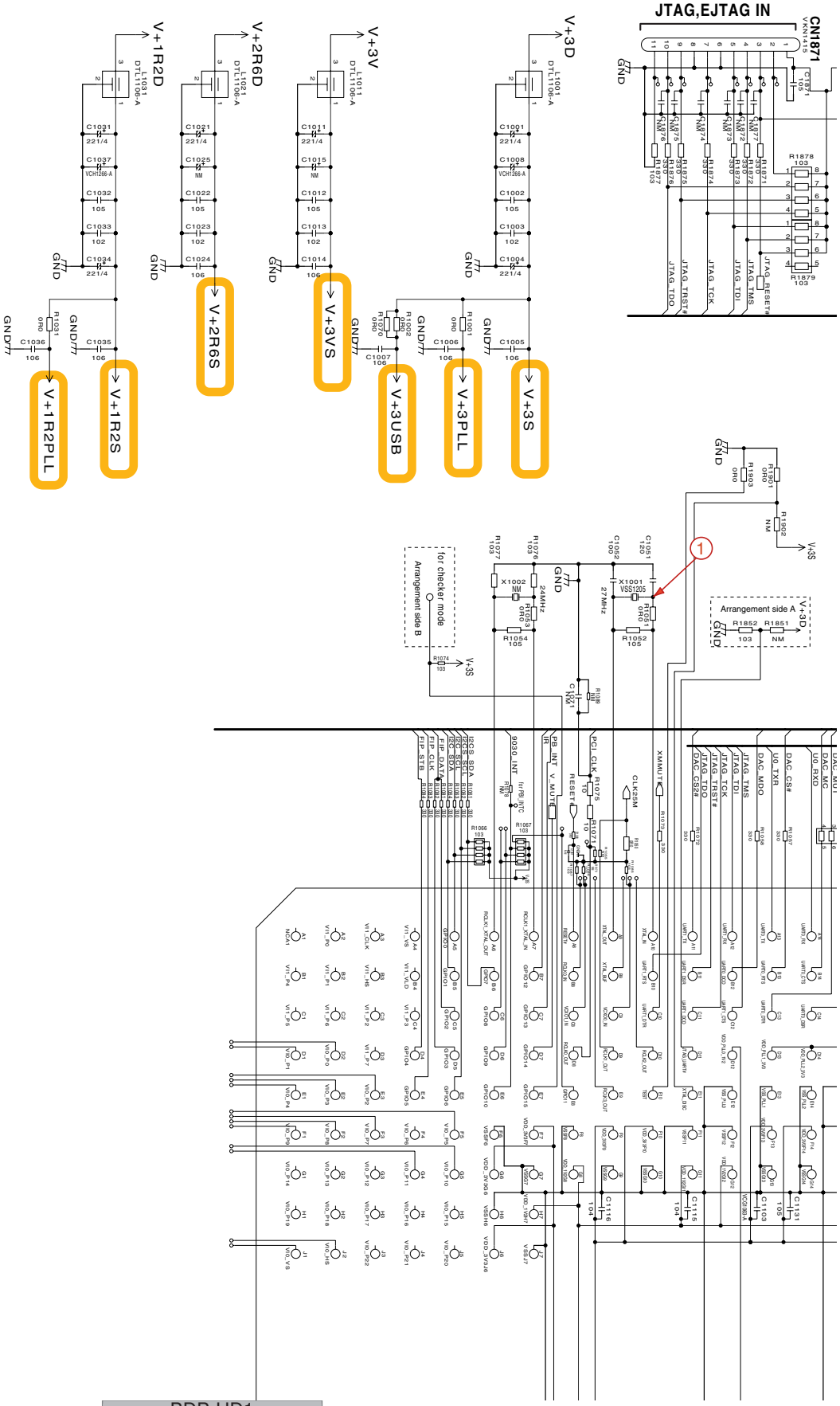


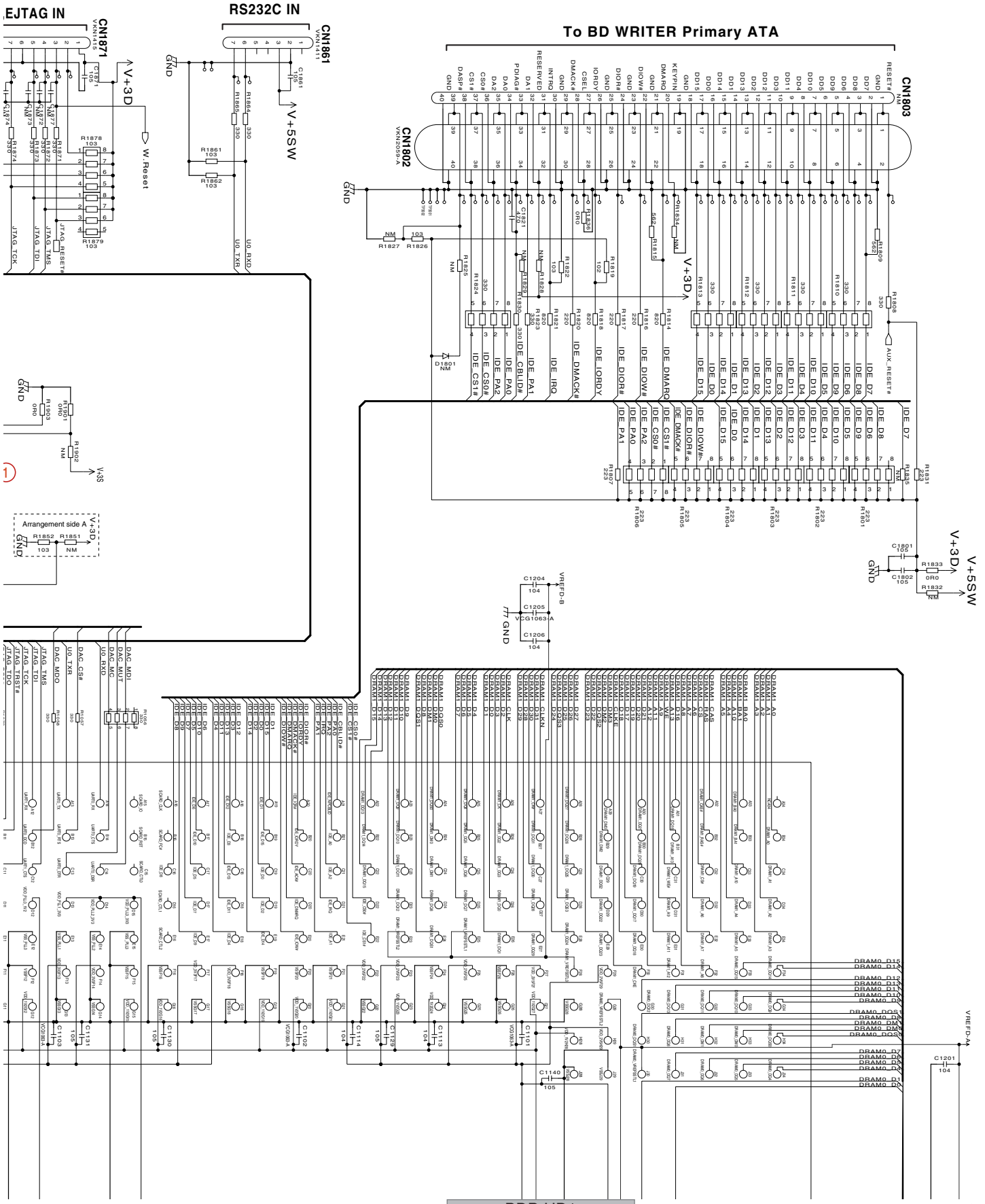
- When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- : The power supply is shown with the marked box.

A 1/7 MAIN ASSY(VWV2234)

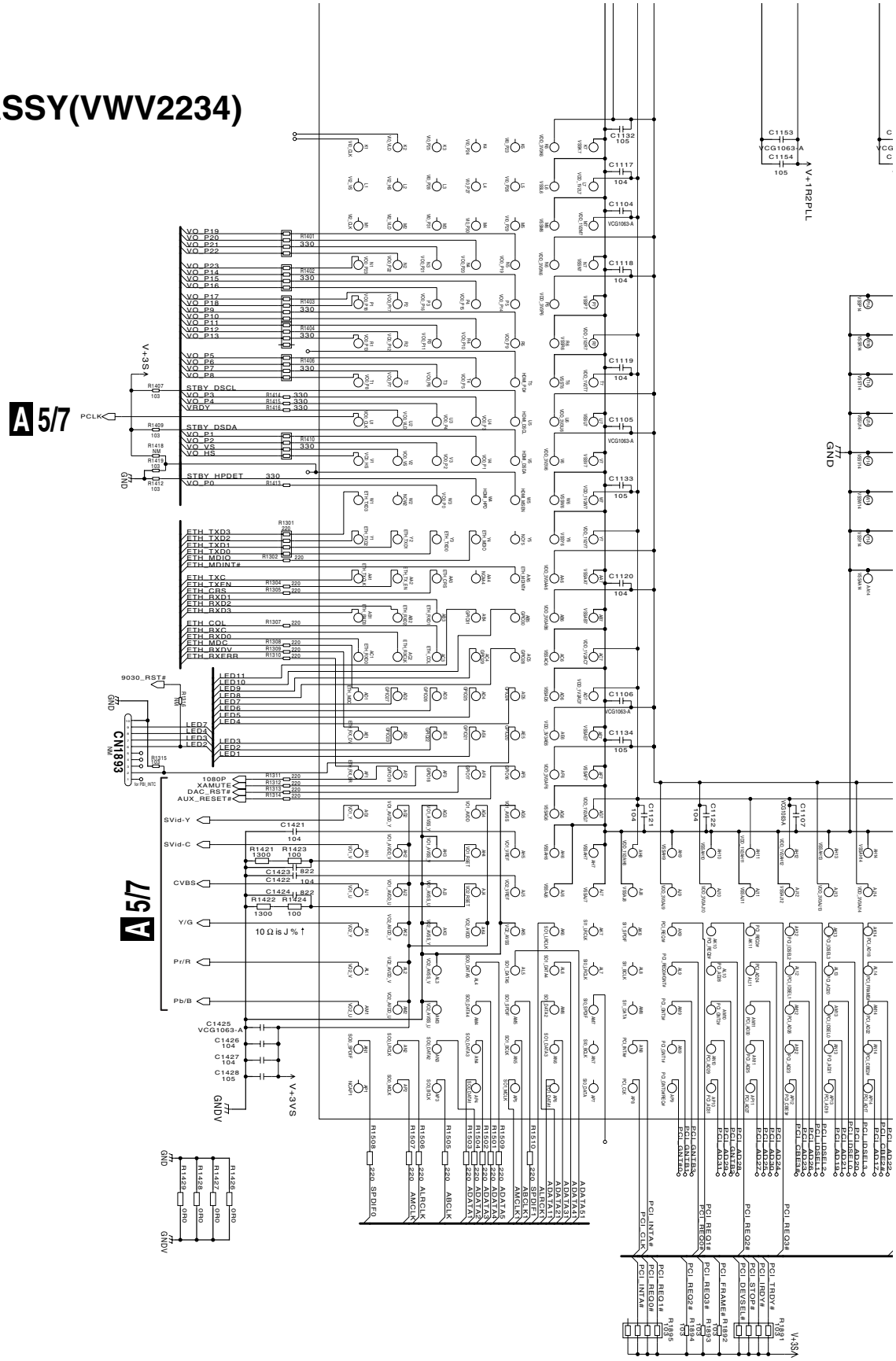
Large size SCH diagram



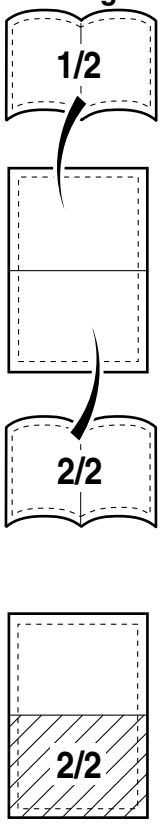



EJTAG IN
CN1871
RS232C IN
CN1861
To BD WRITER Primary ATA
CN1803
CN1802
V+3D
V+5SW
GND
W.Reset
JTAG_TCK
JTAG_TDI
JTAG_TMS
JTAG_RESET#
U0_TXR
U0_RXD
IDE_D7
IDE_D6
IDE_D5
IDE_D4
IDE_D3
IDE_D2
IDE_D1
IDE_D0
IDE_D15
IDE_D14
IDE_D13
IDE_D12
IDE_D11
IDE_D10
IDE_D9
IDE_D8
IDE_PA0
IDE_PA1
IDE_PA2
IDE_CS0#
IDE_CS1#
IDE_DMACK#
IDE_DIOR#
IDE_DIOW#
IDE_IRQ
IDE_IORDY
IDE_DMARQ
IDE_CBLID#
AUX_RESET#
Arrangement side A
VREFD-B
VREFD-A
BDP-HD1
19

A 1/7 MAIN ASSY(VWV2234)



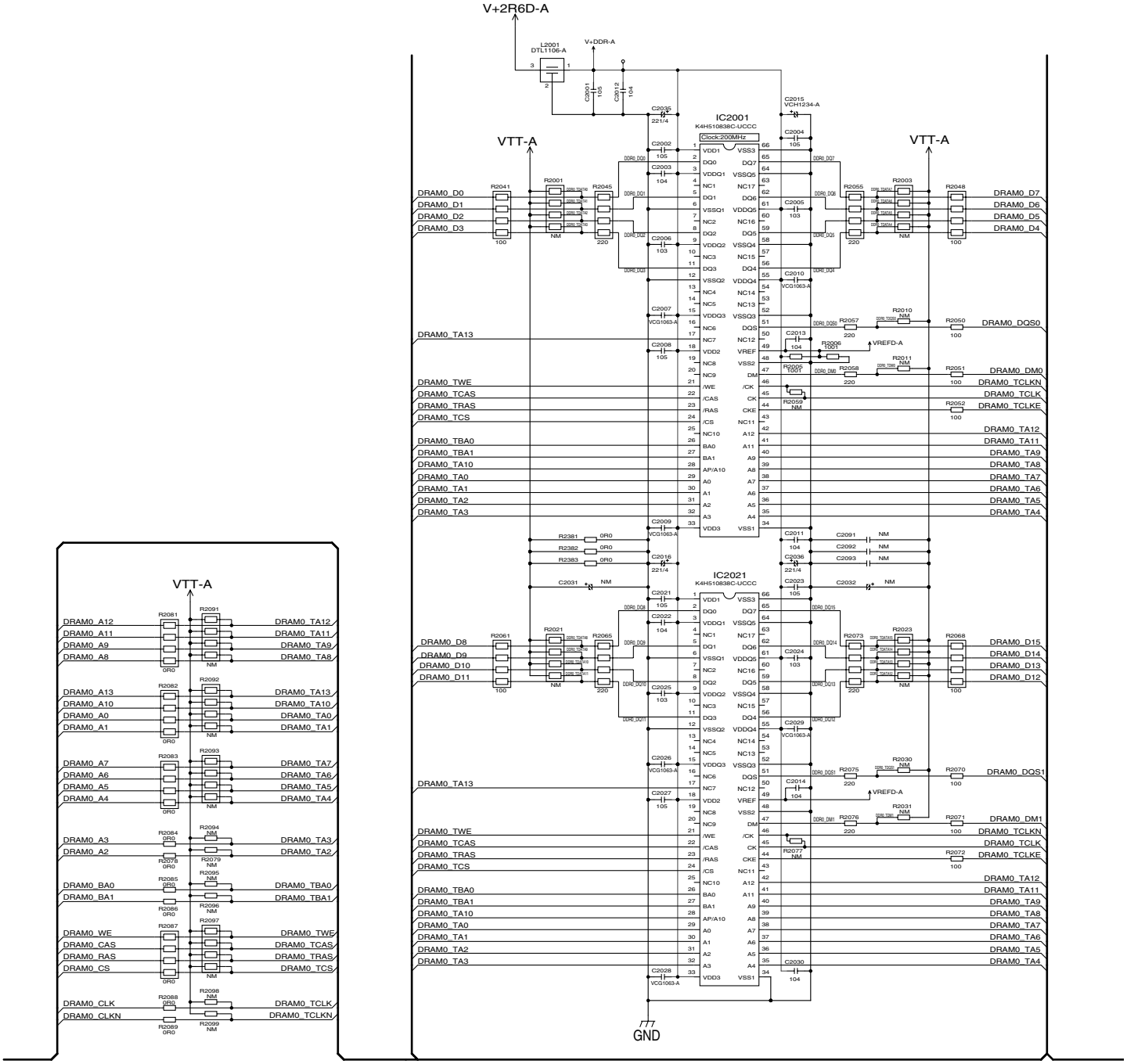
Large size SCH diagram

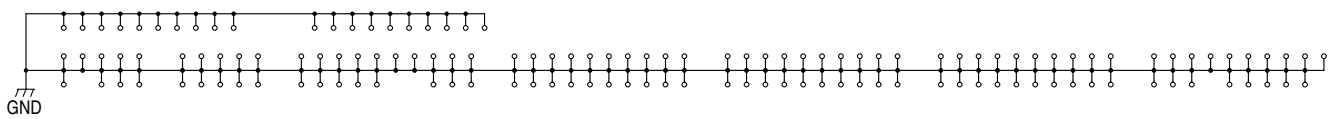


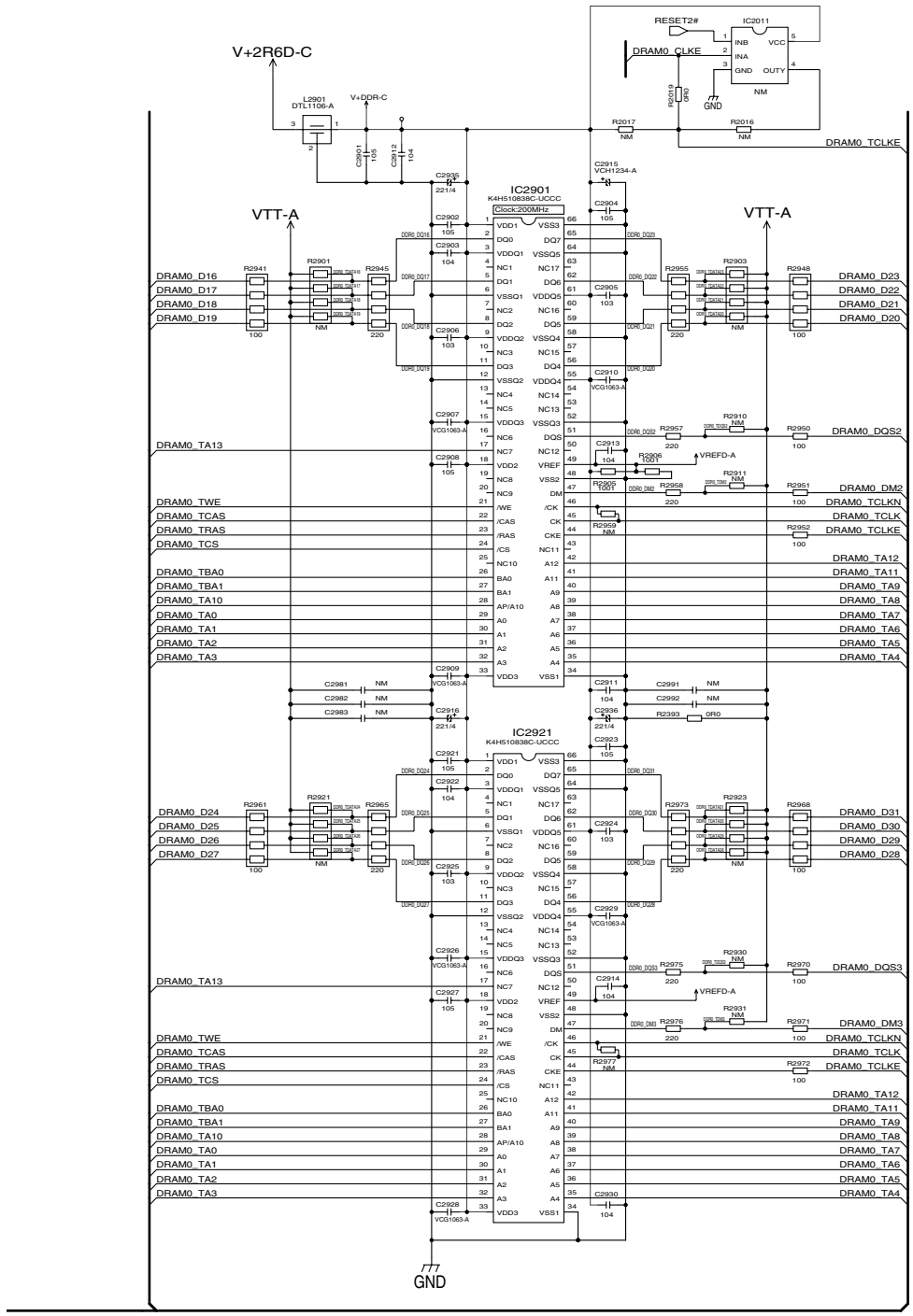
IC1001
(SMP8634LF)
MAIN LSI

3.5 MAIN ASSY 2/7

A 2/7 MAIN ASSY(VWV2234)

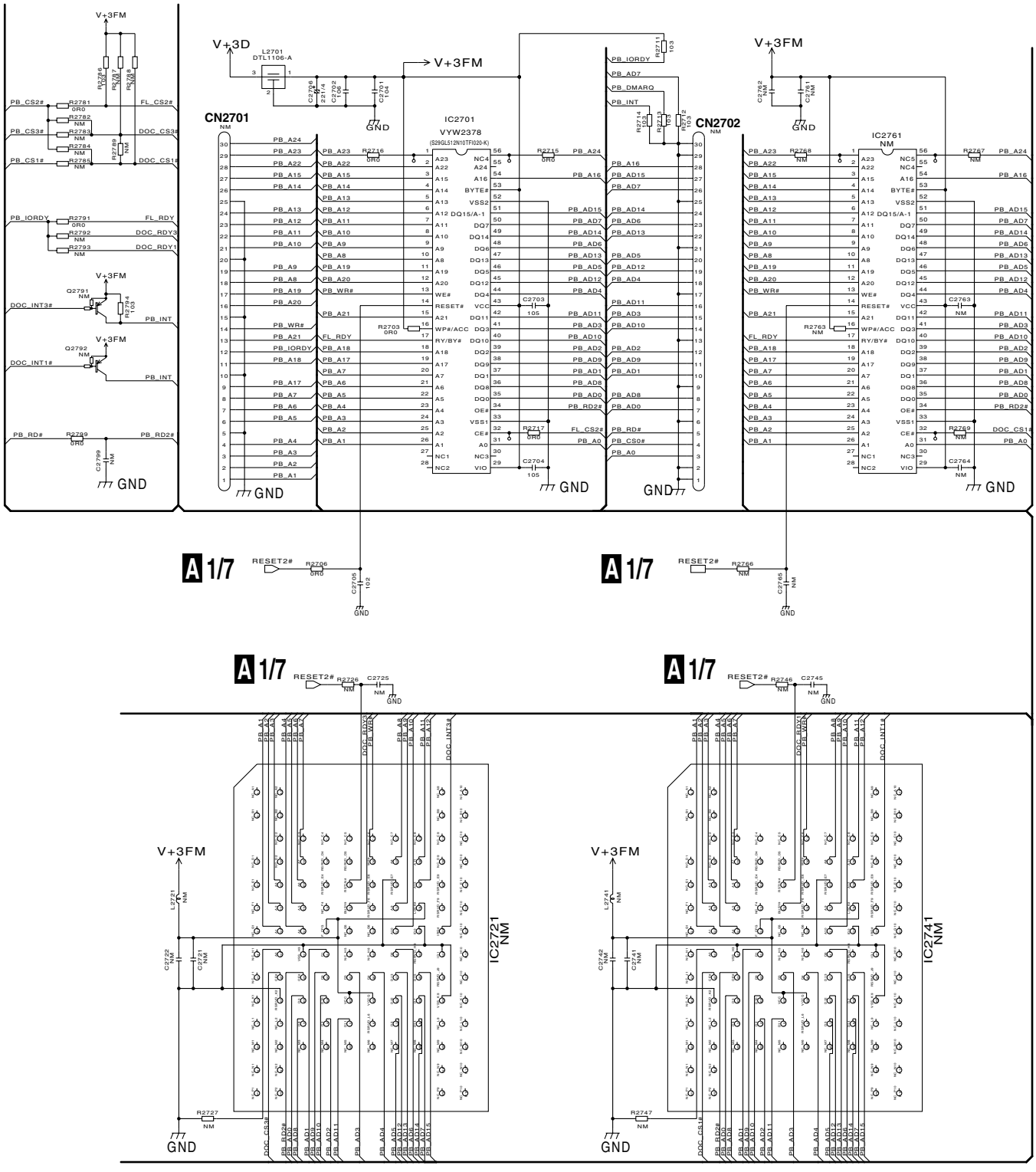


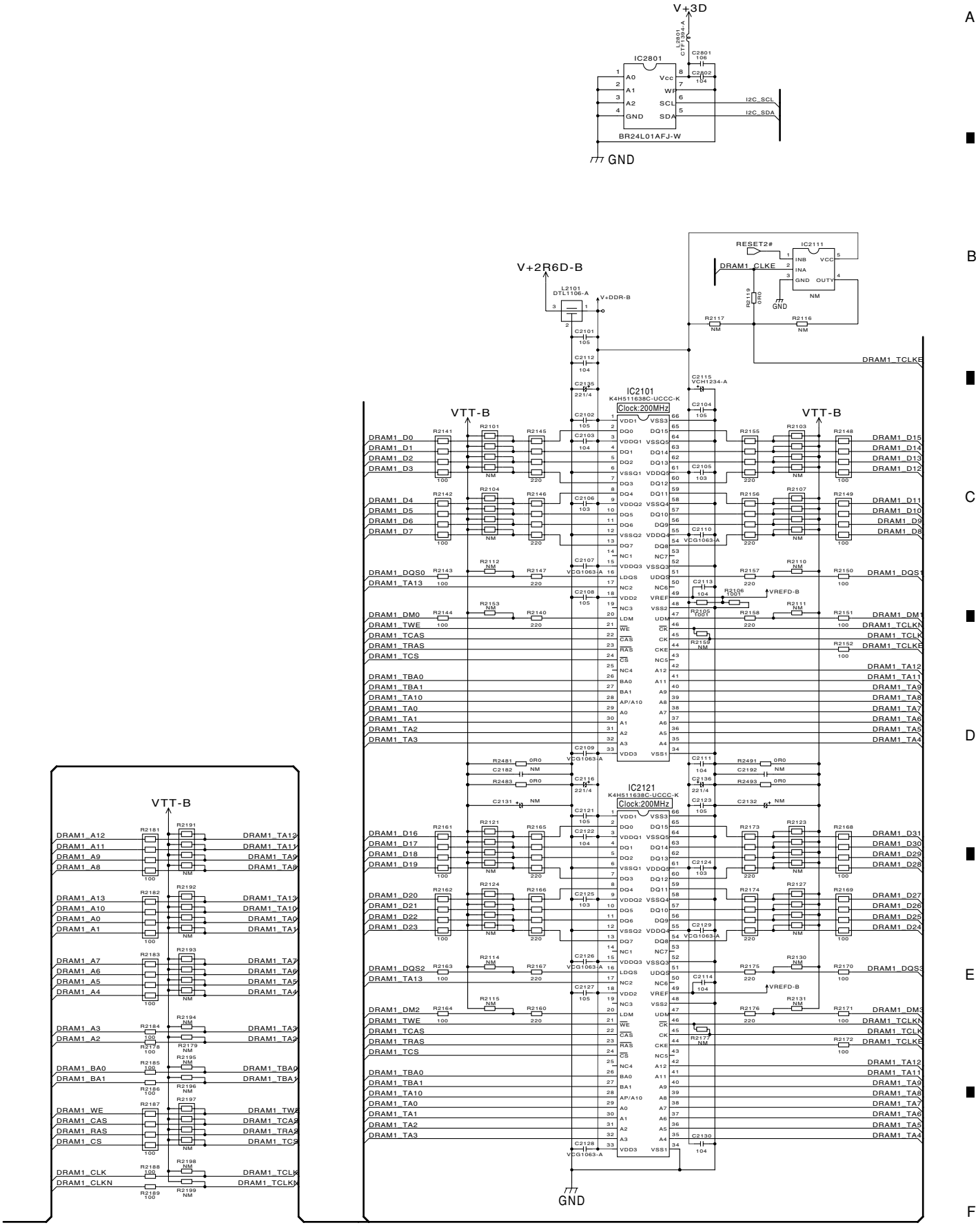



V+2R6D-C
L2901
DTL1106-A
V+DDR-C
C2901
105
C2912
104
C2935
221/4
RESET2#
IC2011
DRAM0_CLKE
INB
INA
GND
VCC
OUTY
NM
R2019
0R0
R2017
NM
R2016
NM
DRAM0_TCLKE
C2915
VCH1234-A
IC2901
K4H510838C-UCCC
Clock:200MHz
VTT-A
C2904
105
C2902
105
C2903
104
C2905
103
C2906
103
C2910
VCG1063-A
C2907
VCG1063-A
C2908
105
C2909
VCG1063-A
C2913
104
R2906
100T
R2905
100T
VREFD-A
R2959
NM
C2981
NM
C2982
NM
C2983
NM
C2916
221/4
C2911
104
C2991
NM
C2992
NM
C2936
221/4
R2393
0R0
IC2921
K4H510838C-UCCC
C2921
105
C2922
104
C2924
103
C2925
103
C2929
VCG1063-A
C2926
VCG1063-A
C2927
105
C2928
VCG1063-A
C2923
105
C2914
104
R2977
NM
C2930
104
R2941
R2901
R2945
R2955
R2903
R2948
R2910
NM
R2957
R2950
R2911
NM
R2958
R2951
R2952
R2961
R2921
R2965
R2973
R2923
R2968
R2930
NM
R2975
R2970
R2931
NM
R2976
R2971
R2972
100
NM
220
DRAM0_D16
DRAM0_D17
DRAM0_D18
DRAM0_D19
DRAM0_D23
DRAM0_D22
DRAM0_D21
DRAM0_D20
DRAM0_TA13
DRAM0_DQS2
DRAM0_DM2
DRAM0_TCLKN
DRAM0_TCLK
DRAM0_TCLKE
DRAM0_TWE
DRAM0_TCAS
DRAM0_TRAS
DRAM0_TCS
DRAM0_TBA0
DRAM0_TBA1
DRAM0_TA10
DRAM0_TA0
DRAM0_TA1
DRAM0_TA2
DRAM0_TA3
DRAM0_TA12
DRAM0_TA11
DRAM0_TA9
DRAM0_TA8
DRAM0_TA7
DRAM0_TA6
DRAM0_TA5
DRAM0_TA4
DRAM0_D24
DRAM0_D25
DRAM0_D26
DRAM0_D27
DRAM0_D31
DRAM0_D30
DRAM0_D29
DRAM0_D28
DRAM0_DQS3
DRAM0_DM3
GND

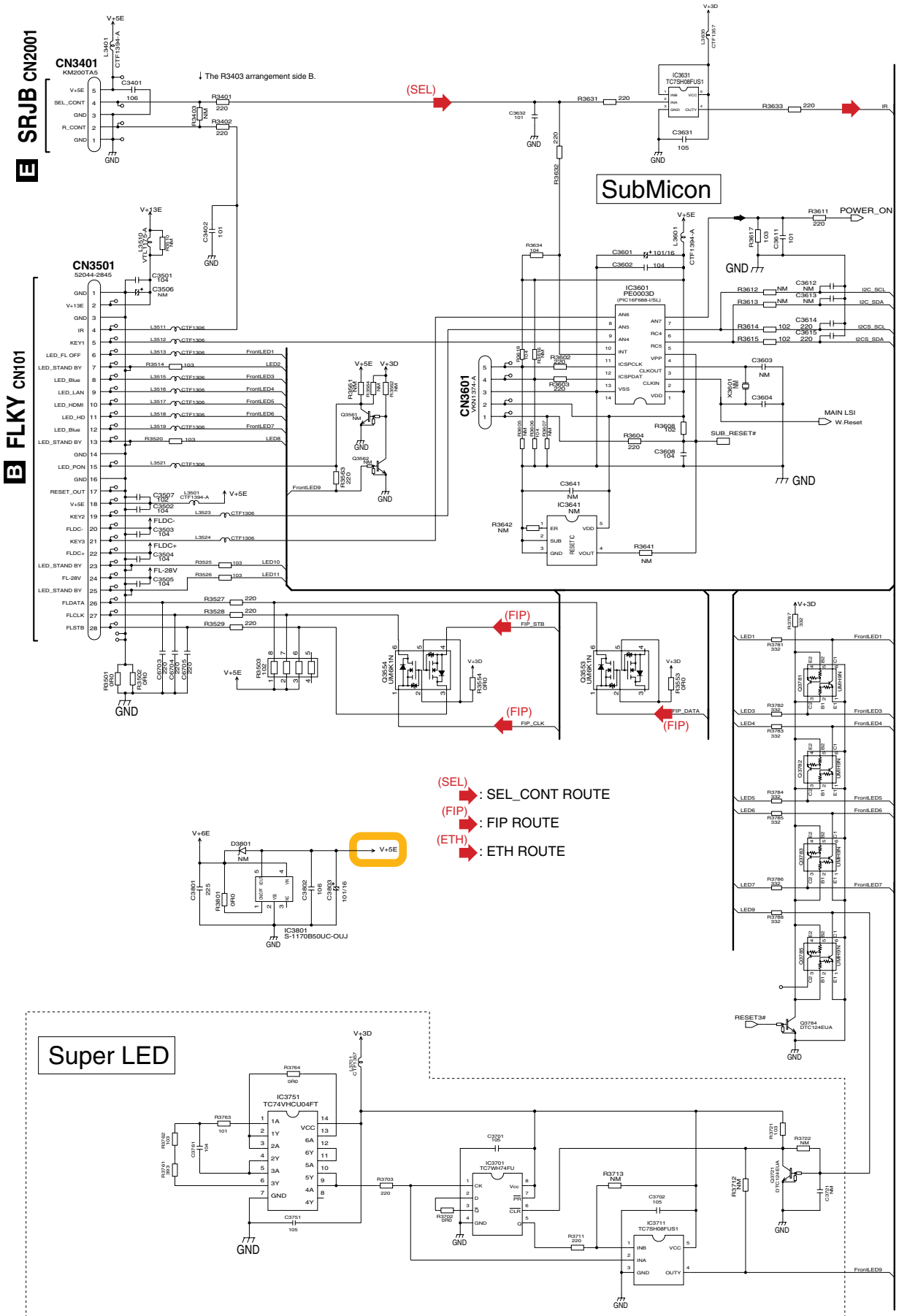
3.6 MAIN ASSY 3/7

A 3/7 MAIN ASSY(VWV2234)

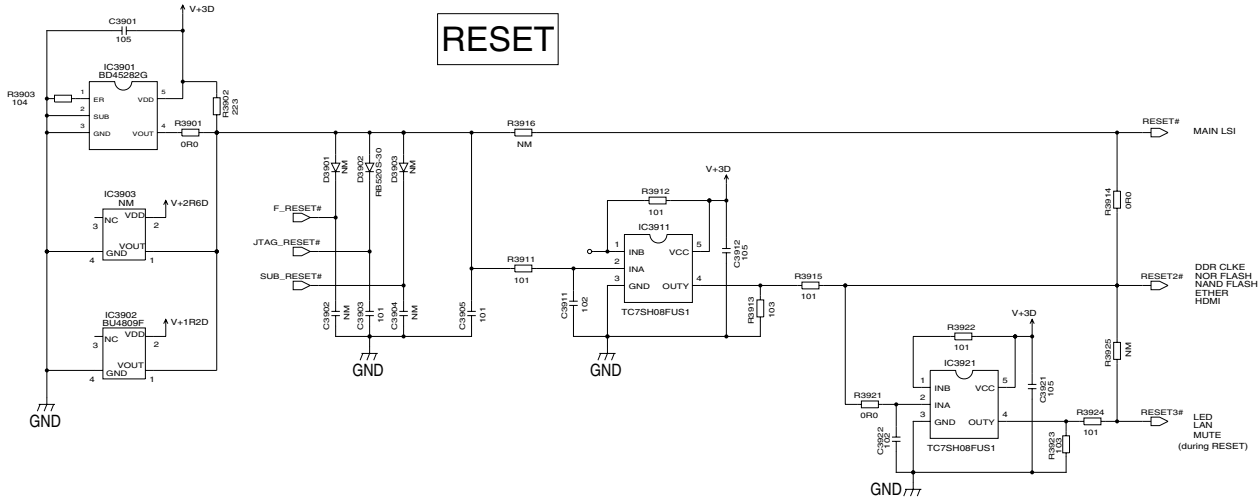



V+3D
L2801
CTF0204-A
IC2801
C2801
106
C2802
104
A0
A1
A2
GND
Vcc
WP
SCL
SDA
I2C_SCL
I2C_SDA
BR24L01AFJ-W
GND
V+2R6D-B
L2101
DTL1106-A
V+DDR-B
RESET2#
IC2111
DRAM1_CLKE
INB
INA
GND
VCC
OUTY
NM
R2119
0R0
R2117
R2116
DRAM1_TCLKE
C2101
105
C2112
104
C2135
221/4
C2115
VCH1234-A
IC2101
K4H511638C-UCCC-K
Clock:200MHz
VTT-B
C2104
105
C2102
105
C2103
104
C2105
103
C2106
103
C2110
VCG1063-A
C2107
VCG1063-A
C2113
104
R2106
100
VREFD-B
C2108
105
C2109
VCG1063-A
R2105
100
R2158
220
R2111
NM
R2152
100
R2153
NM
R2140
220
R2144
100
R2112
NM
R2147
220
R2143
100
R2104
NM
R2146
220
R2142
100
R2101
NM
R2145
220
R2141
100
R2155
220
R2103
NM
R2148
100
R2156
220
R2107
NM
R2149
100
R2157
220
R2110
NM
R2150
100
DRAM1_D0
DRAM1_D1
DRAM1_D2
DRAM1_D3
DRAM1_D4
DRAM1_D5
DRAM1_D6
DRAM1_D7
DRAM1_DQS0
DRAM1_TA13
DRAM1_DM0
DRAM1_TWE
DRAM1_TCAS
DRAM1_TRAS
DRAM1_TCS
DRAM1_TBA0
DRAM1_TBA1
DRAM1_TA10
DRAM1_TA0
DRAM1_TA1
DRAM1_TA2
DRAM1_TA3
DRAM1_D15
DRAM1_D14
DRAM1_D13
DRAM1_D12
DRAM1_D11
DRAM1_D10
DRAM1_D9
DRAM1_D8
DRAM1_DQS1
DRAM1_DM1
DRAM1_TCLKN
DRAM1_TCLK
DRAM1_TCLKE
DRAM1_TA12
DRAM1_TA11
DRAM1_TA9
DRAM1_TA8
DRAM1_TA7
DRAM1_TA6
DRAM1_TA5
DRAM1_TA4
R2481
0R0
C2182
NM
R2483
0R0
C2131
NM
C2116
221/4
IC2121
K4H511638C-UCCC-K
Clock:200MHz
C2121
105
C2122
104
C2125
103
C2126
VCG1063-A
C2127
105
C2128
VCG1063-A
R2491
0R0
C2192
NM
R2493
0R0
C2132
NM
C2136
221/4
C2123
105
C2124
103
C2129
VCG1063-A
C2111
104
C2114
104
C2130
104
R2131
NM
R2115
NM
R2114
NM
R2167
220
R2163
100
R2121
NM
R2165
220
R2161
100
R2124
NM
R2166
220
R2162
100
R2160
220
R2164
100
R2173
220
R2123
NM
R2168
100
R2174
220
R2127
NM
R2169
100
R2175
220
R2130
NM
R2170
100
R2176
220
R2171
100
R2172
NM
DRAM1_D16
DRAM1_D17
DRAM1_D18
DRAM1_D19
DRAM1_D20
DRAM1_D21
DRAM1_D22
DRAM1_D23
DRAM1_DQS2
DRAM1_TA13
DRAM1_DM2
DRAM1_TWE
DRAM1_TCAS
DRAM1_TRAS
DRAM1_TCS
DRAM1_TBA0
DRAM1_TBA1
DRAM1_TA10
DRAM1_TA0
DRAM1_TA1
DRAM1_TA2
DRAM1_TA3
DRAM1_D31
DRAM1_D30
DRAM1_D29
DRAM1_D28
DRAM1_D27
DRAM1_D26
DRAM1_D25
DRAM1_D24
DRAM1_DQS3
DRAM1_DM3
DRAM1_TCLKN
DRAM1_TCLK
DRAM1_TCLKE
DRAM1_TA12
DRAM1_TA11
DRAM1_TA9
DRAM1_TA8
DRAM1_TA7
DRAM1_TA6
DRAM1_TA5
DRAM1_TA4
GND
VTT-B
R2191
R2181
R2192
R2182
R2193
R2183
R2194
NM
R2184
100
R2178
100
R2179
NM
R2195
NM
R2185
100
R2186
100
R2196
NM
R2197
R2187
R2198
NM
R2188
100
R2189
100
R2199
NM
DRAM1_A12
DRAM1_A11
DRAM1_A9
DRAM1_A8
DRAM1_A13
DRAM1_A10
DRAM1_A0
DRAM1_A1
DRAM1_A7
DRAM1_A6
DRAM1_A5
DRAM1_A4
DRAM1_A3
DRAM1_A2
DRAM1_BA0
DRAM1_BA1
DRAM1_WE
DRAM1_CAS
DRAM1_RAS
DRAM1_CS
DRAM1_CLK
DRAM1_CLKN
DRAM1_TA12
DRAM1_TA11
DRAM1_TA9
DRAM1_TA8
DRAM1_TA13
DRAM1_TA10
DRAM1_TA0
DRAM1_TA1
DRAM1_TA7
DRAM1_TA6
DRAM1_TA5
DRAM1_TA4
DRAM1_TA2
DRAM1_TA3
DRAM1_TBA0
DRAM1_TBA1
DRAM1_TWE
DRAM1_TCAS
DRAM1_TRAS
DRAM1_TCS
DRAM1_TCLK
DRAM1_TCLKN

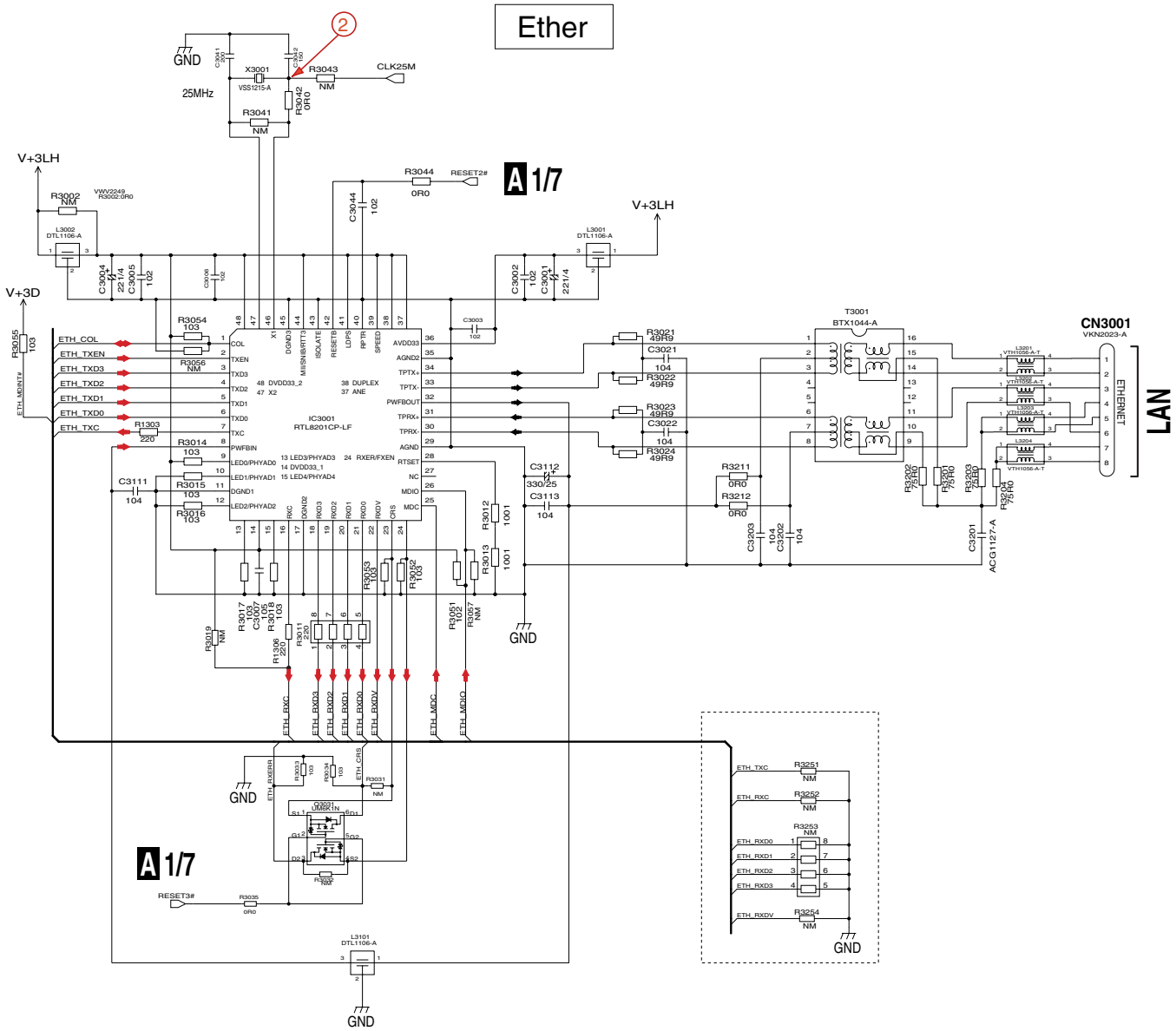
A 4/7 MAIN ASSY(VWV2234)



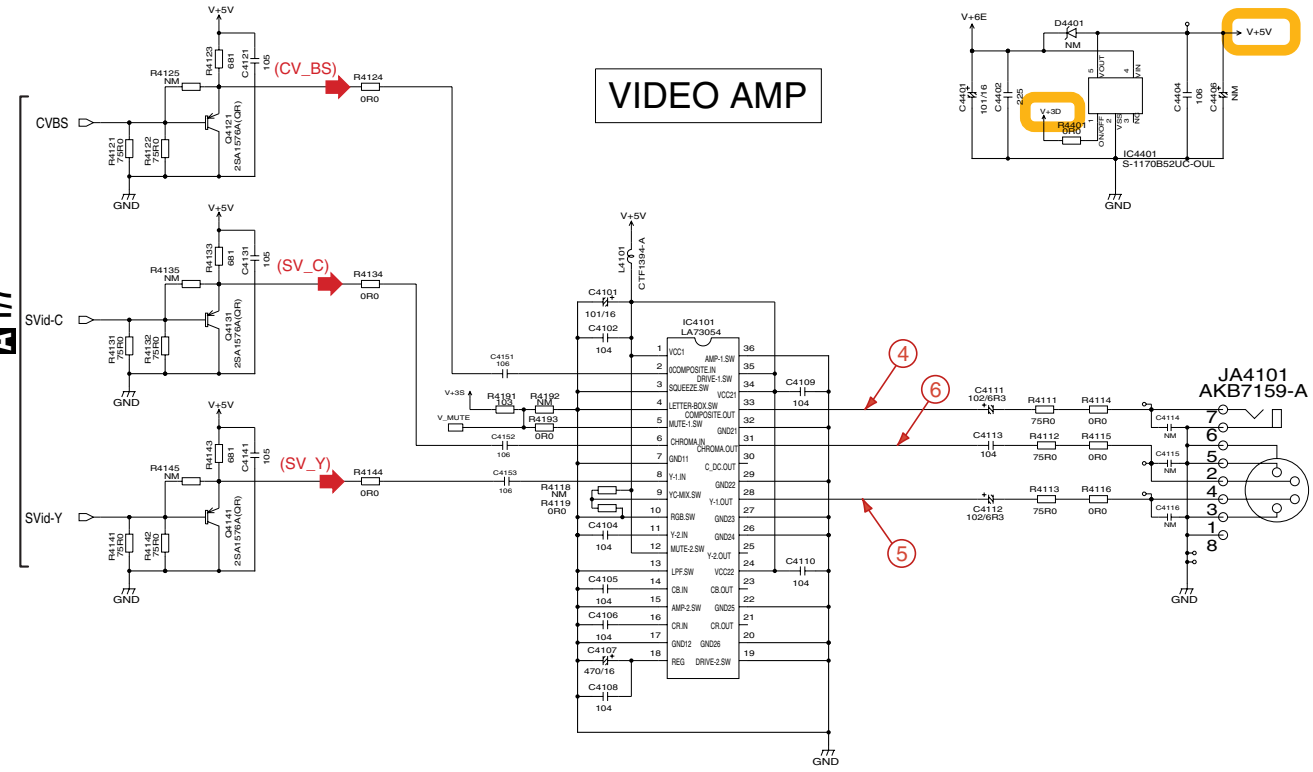
RESET

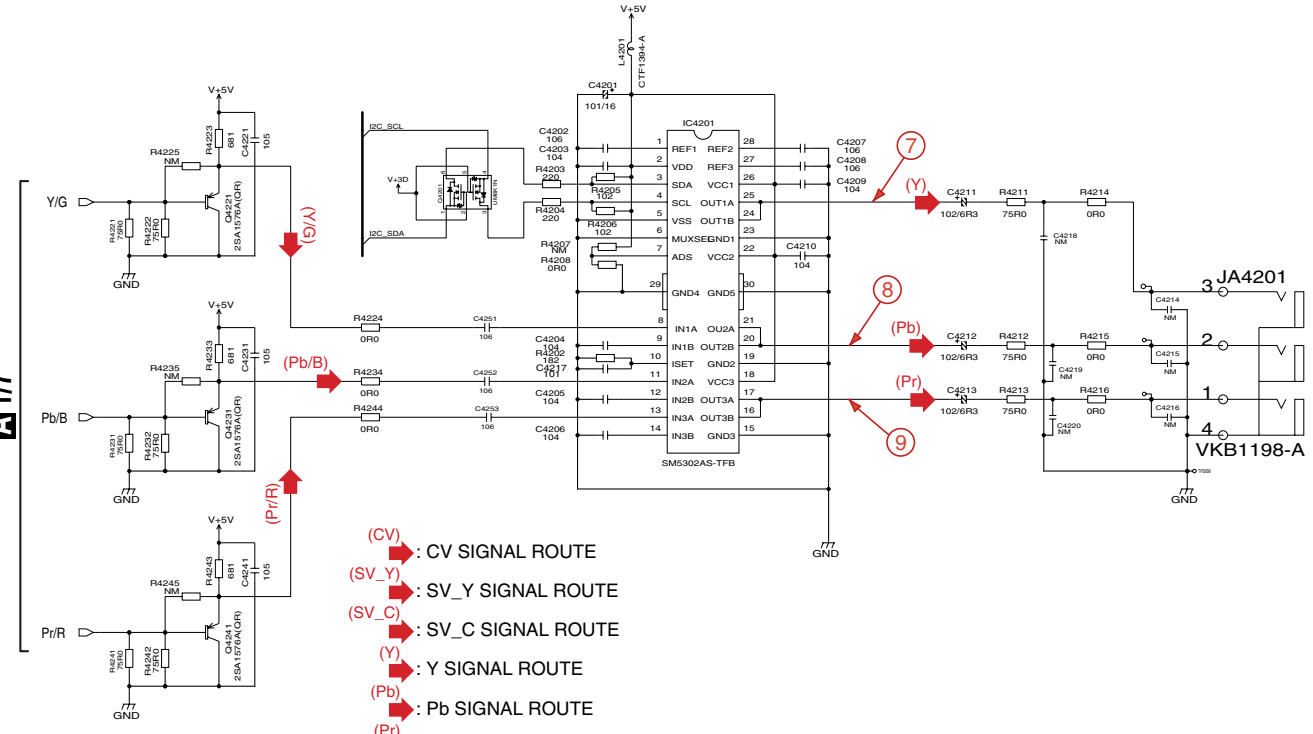

V+3D
C3901 105
IC3901 BD45282G
R3903 104
R3902 220
R3901 0R0
IC3903 NM
V+2R6D
IC3902 BU4809F
V+1R2D
GND
F_RESET#
JTAG_RESET#
SUB_RESET#
D3901 NM
D3902 RB520S-30
D3903 NM
C3902 NM
C3903 101
C3904 NM
C3905 101
R3916 NM
R3911 101
IC3911
R3912 101
C3912 105
C3911 102
R3913 103
TC7SH08FUS1
R3915 101
RESET#
MAIN LSI
R3914 0R0
RESET2#
DDR CLKE
NOR FLASH
NAND FLASH
ETHER
HDMI
R3922 101
IC3921
C3921 105
R3921 0R0
C3922 102
R3923 NM
R3924 101
R3925 NM
RESET3#
LED
LAN
MUTE
(during RESET)

Ether


2
GND
X3001
VSS1215-A
25MHz
R3043 NM
CLK25M
R3042 0R0
R3041 NM
C3041 220
C3042 22
V+3LH
R3044 0R0
RESET2#
A 1/7
R3002 NM
VWV2249 R3002:0R0
L3002 DTL1106-A
L3001 DTL1106-A
C3044 102
C3004 221/4
C3005 102
C3006 102
C3002 102
C3001 221/4
V+3D
R3055 103
ETH_MDINT#
ETH_COL
ETH_TXEN
ETH_TXD3
ETH_TXD2
ETH_TXD1
ETH_TXD0
ETH_TXC
R3054 103
R3056 NM
R1303 220
R3014 103
R3015 103
R3016 103
C3111 104
C3003 102
IC3001
RTL8201CP-LF
C3112 330/25
C3113 104
R3012 1001
R3013 1001
R3053 103
R3052 103
R3017 103
C3007 100
R3018 103
R3011 220
R3019 NM
R1306 220
R3051 0R0
R3057 NM
GND
ETH_RXC
ETH_RXD3
ETH_RXD2
ETH_RXD1
ETH_RXD0
ETH_RXDV
ETH_MDC
ETH_MDIO
ETH_RXER
ETH_CRS
R3032 103
R3034 103
R3033 NM
Q3001 DMG6N
R3037 NM
RESET3#
R3035 0R0
L3101 DTL1106-A
T3001 BTX1044-A
R3021 49R9
C3021 104
R3022 49R9
R3023 49R9
C3022 104
R3024 49R9
R3211 0R0
R3212 0R0
C3203 104
C3202 104
C3201 ACG1127-A
R3202 75R0
R3201 75R0
R3203 75R0
R3204 75R0
CN3001 VKN2023-A
ETHERNET
LAN
R3251 NM
R3252 NM
R3253 NM
R3254 NM
A 1/7

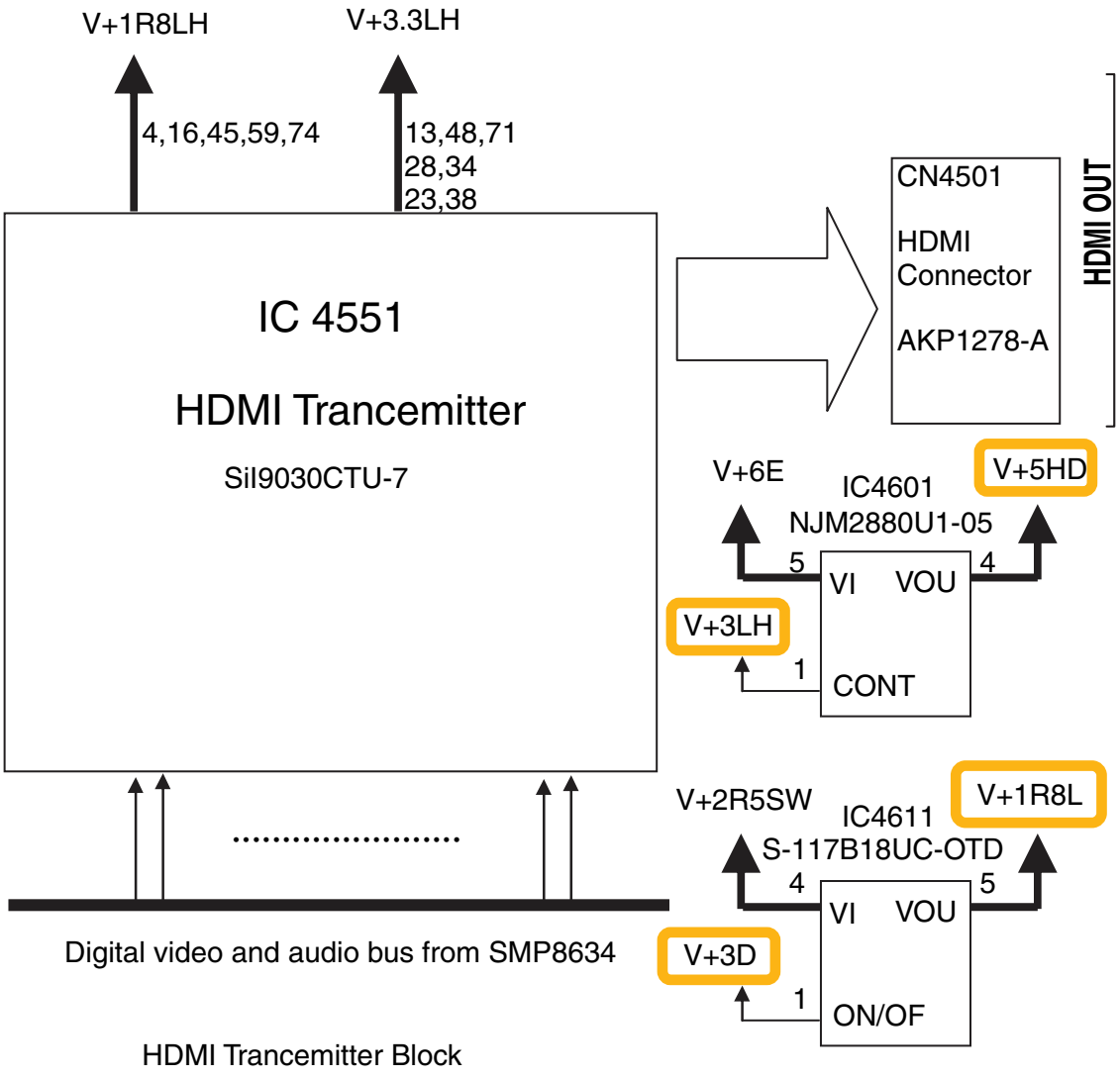
A 5/7 MAIN ASSY(VWV2234)





A 5/7

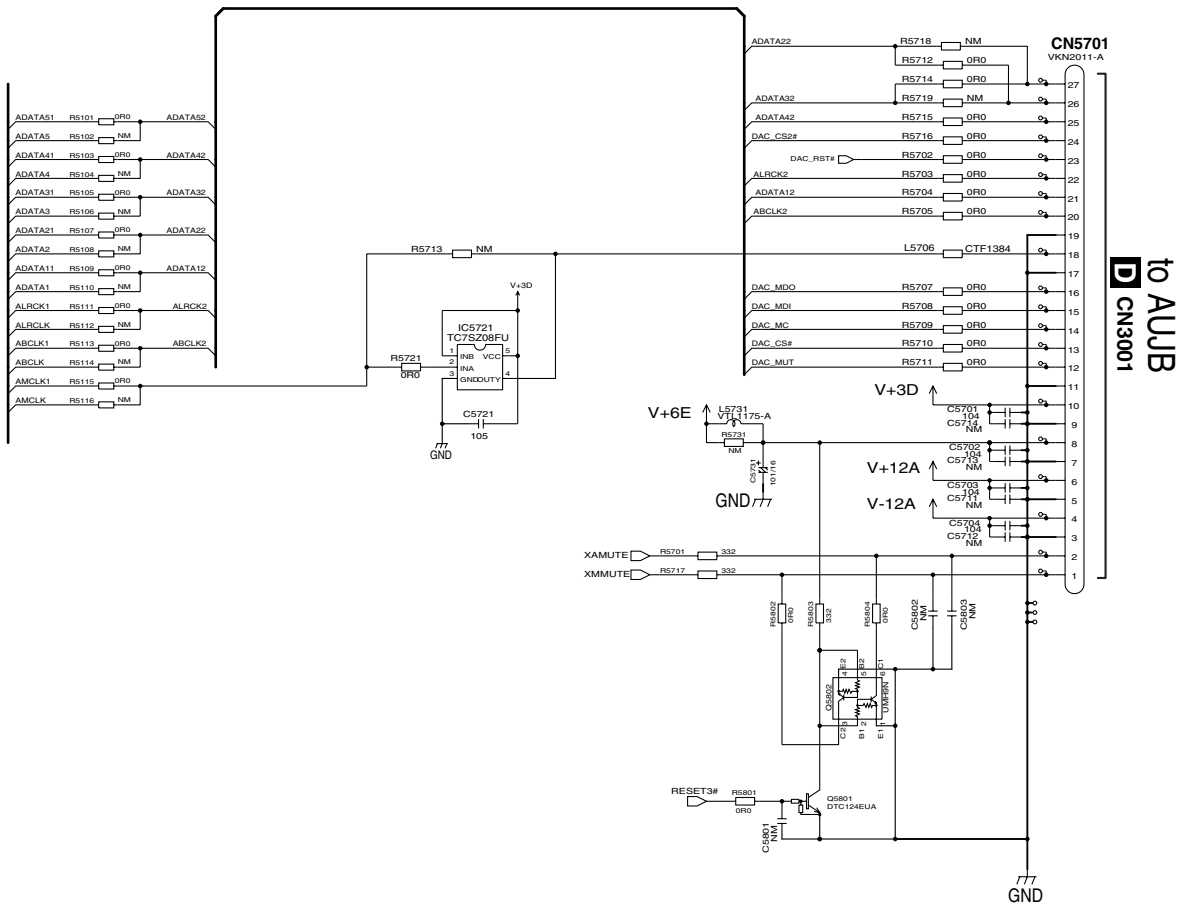
HDMI



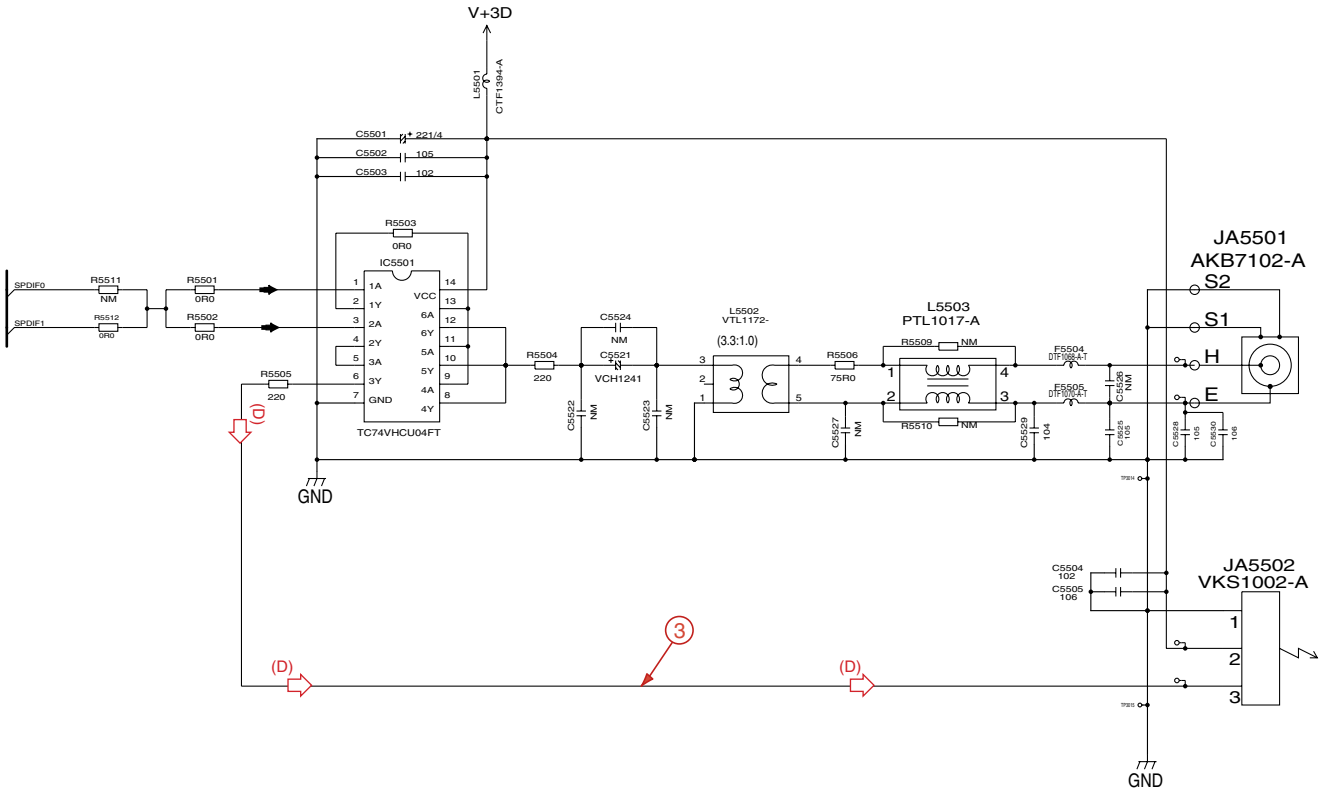
HDMI Trancemitter Block

A 6/7 MAIN ASSY(VWV2234)

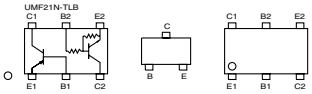
AUDIO I/F



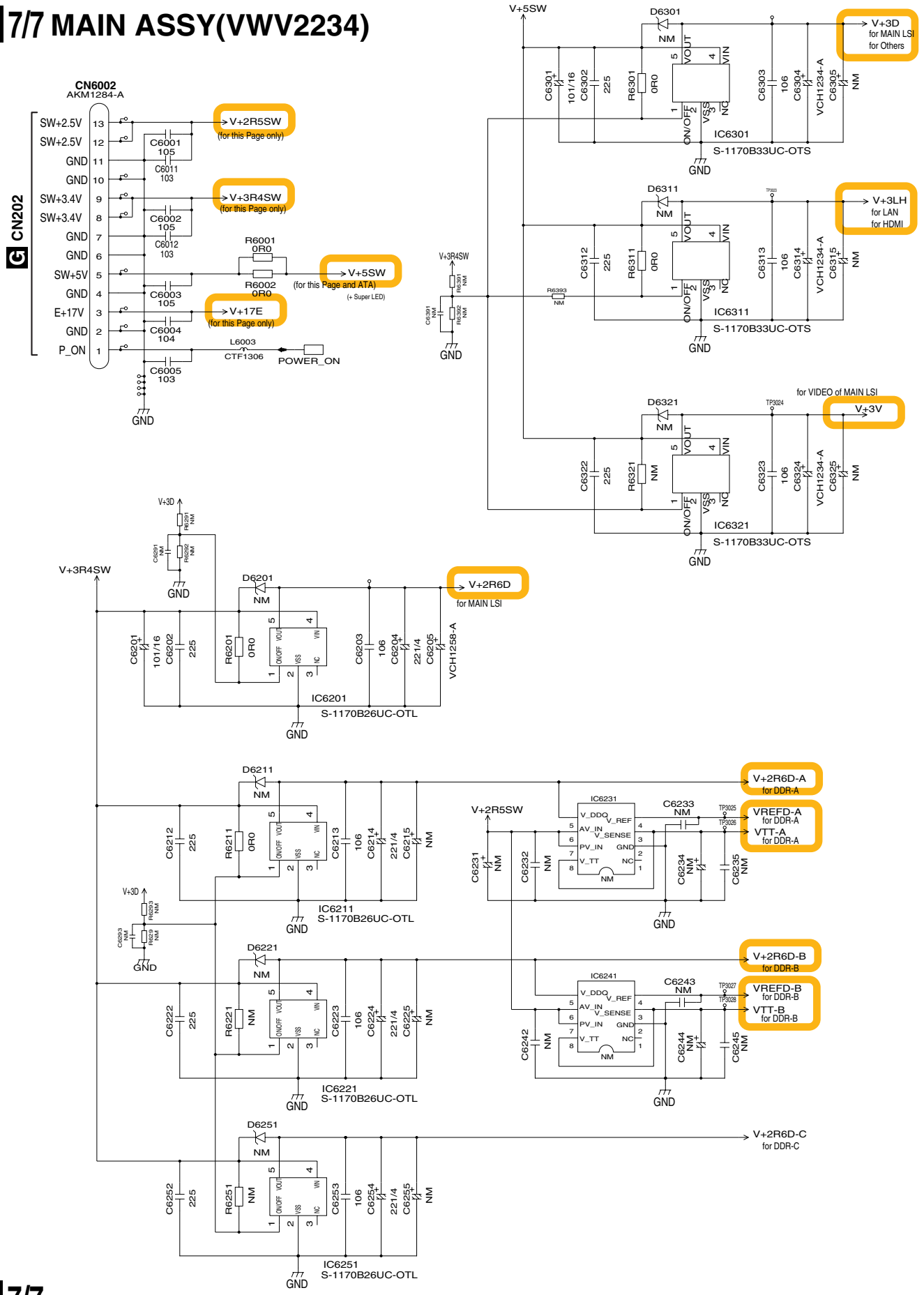
AUDIO Digital



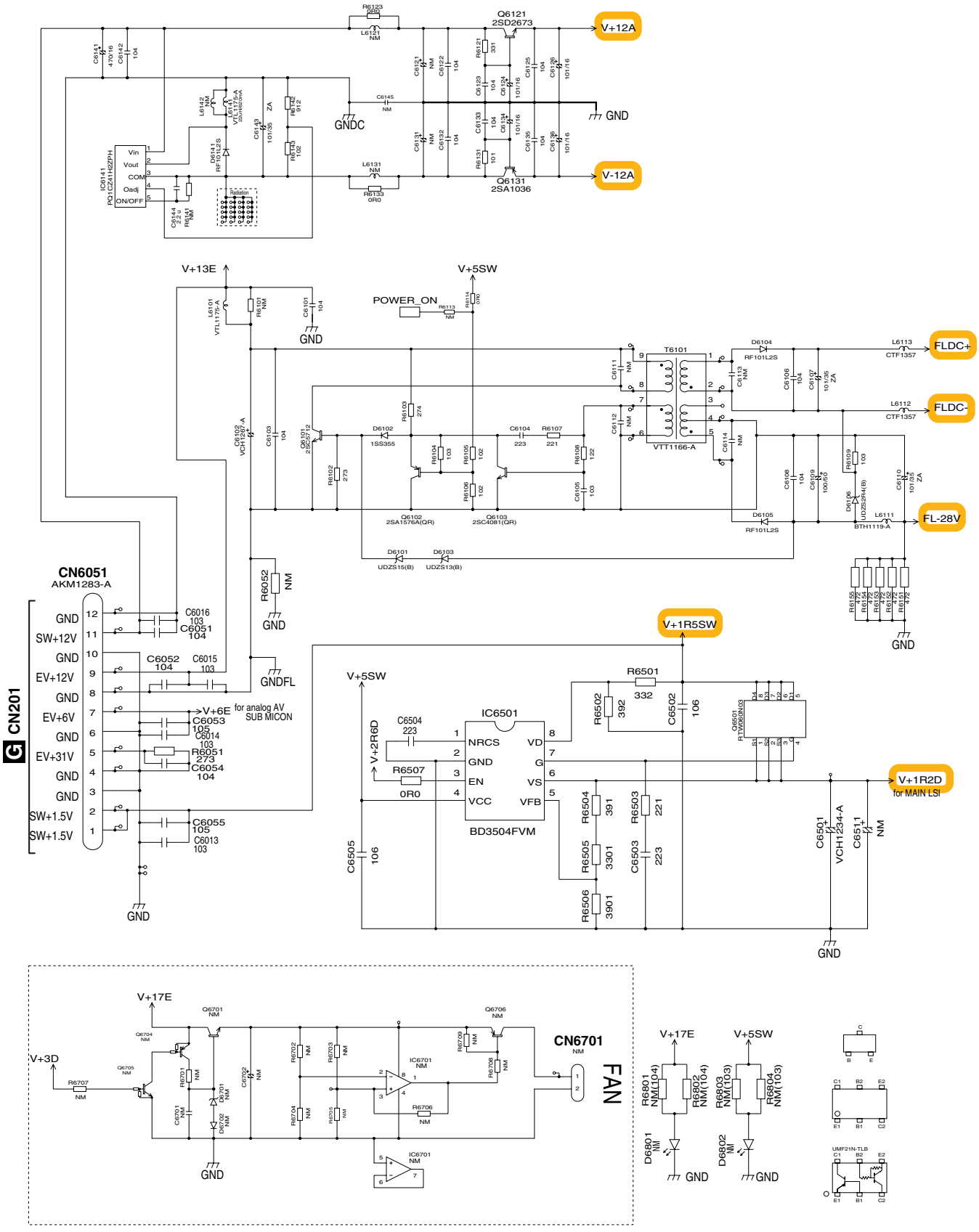
(D): AUDIO (DIGITAL) SIGNAL ROUTE



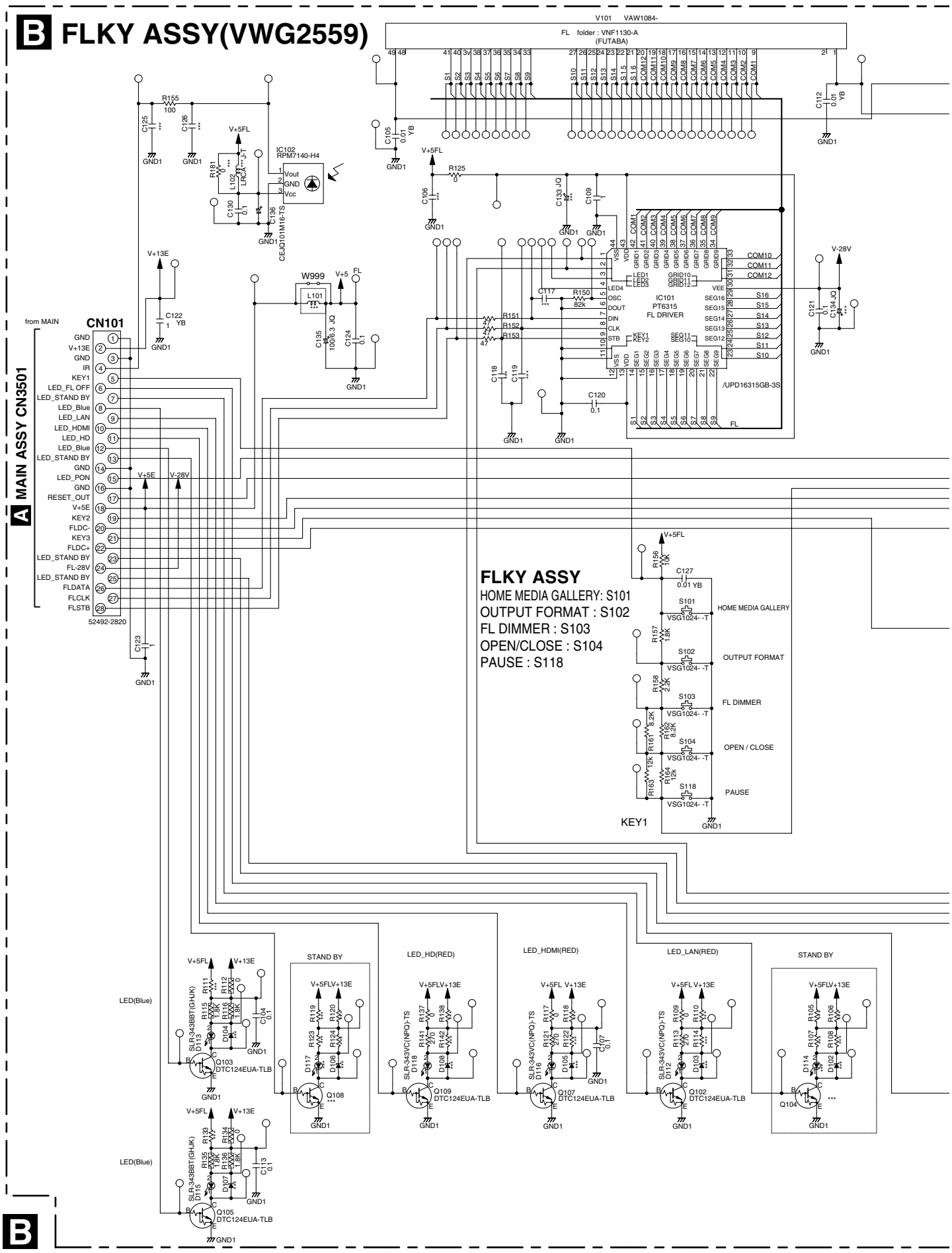
A 7/7 MAIN ASSY(VWV2234)



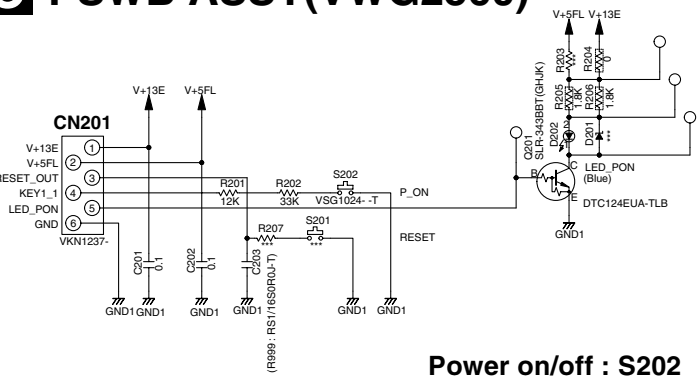
A 7/7


V+12A
V-12A
GND
GNDC
Q6121
2SD2673
Q6131
2SA1036
IC6141
PQ1C241H2ZPH
Vin
Vout
COM
Oadj
ON/OFF
V+13E
V+5SW
POWER_ON
T6101
VTT1166-A
FLDC+
FLDC-
FL-28V
Q6102
2SA1576A(QR)
Q6103
2SC4081(QR)
CN6051
AKM1283-A
CN201
GNDFL
V+6E
for analog AV
SUB MICON
V+1R5SW
V+5SW
IC6501
BD3504FVM
V+2R6D
V+1R2D
for MAIN LSI
V+17E
V+3D
CN6701
FAN
V+17E
V+5SW

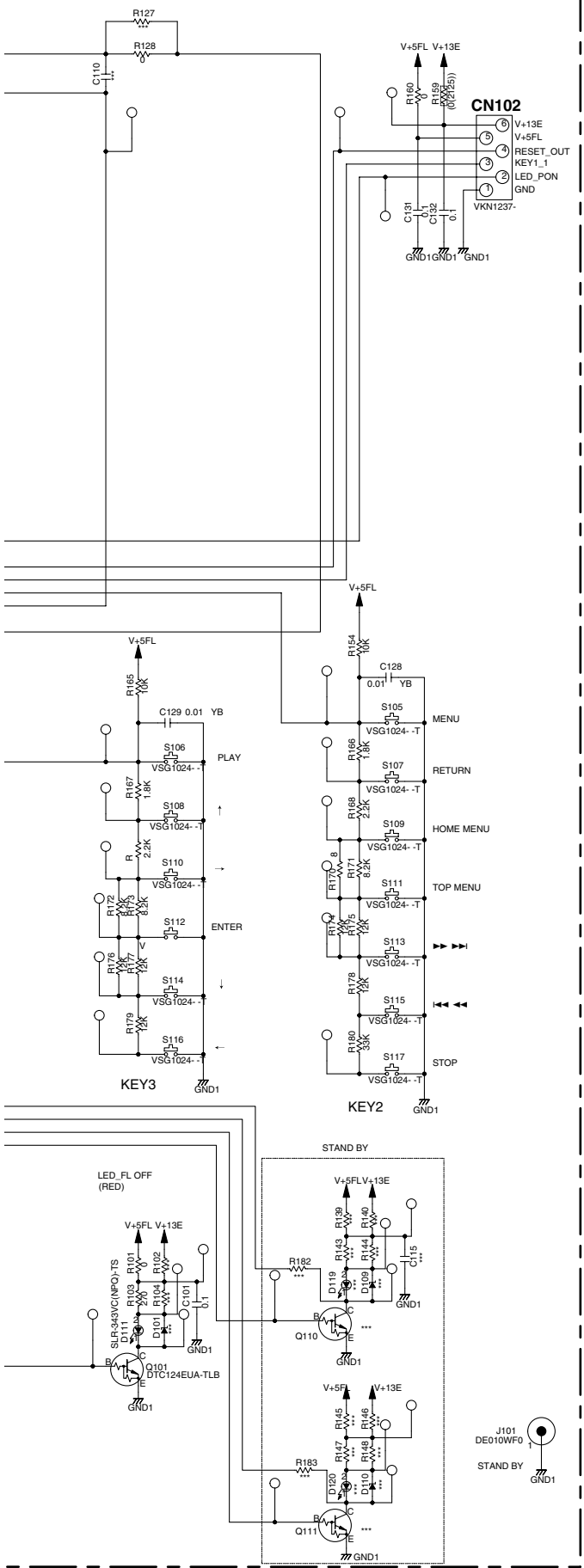
3.11 FLKY and PSWB ASSYS



C PSWB ASSY(VWG2560)



Power on/off : S202



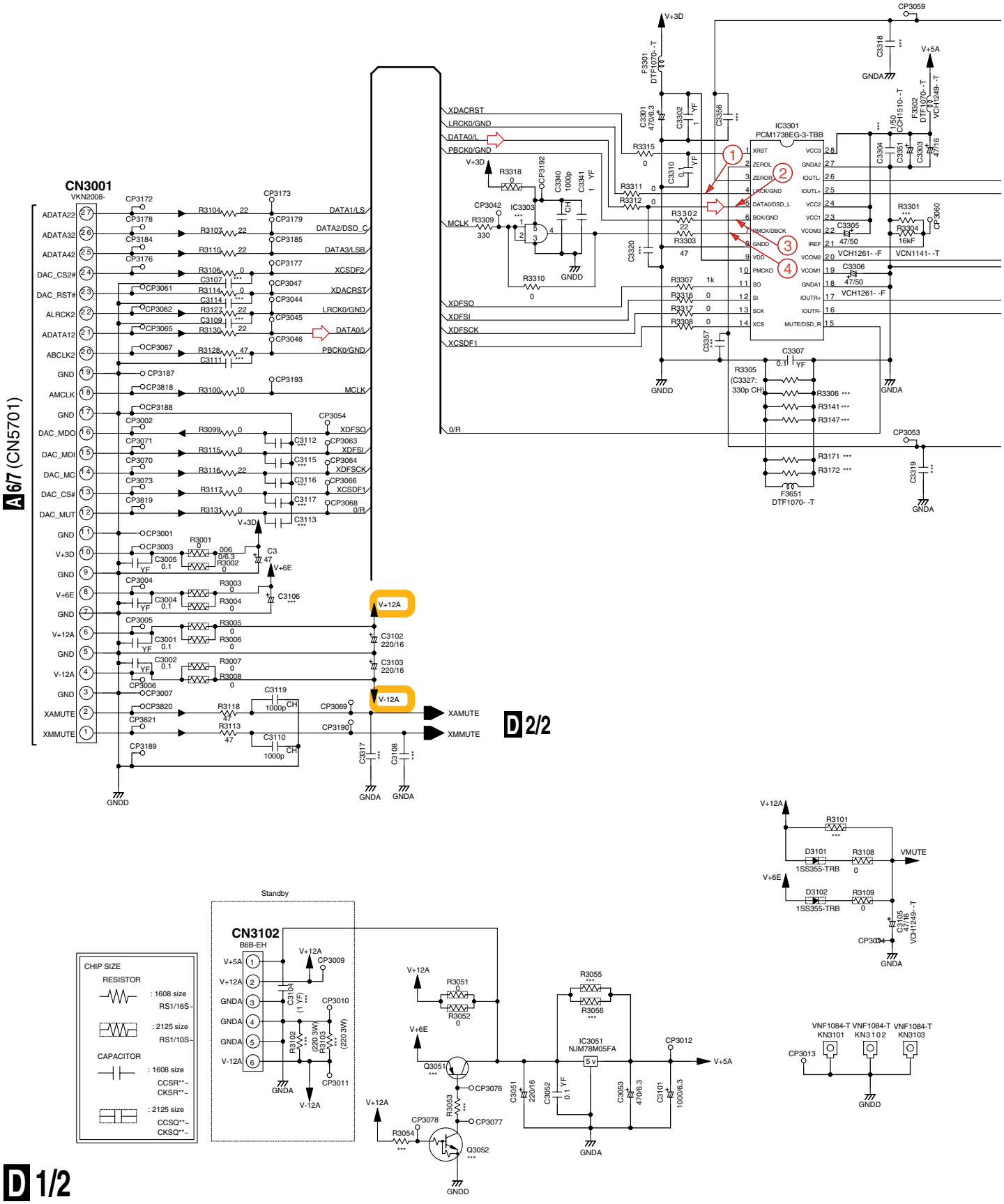
FLKY ASSY : KEY 2

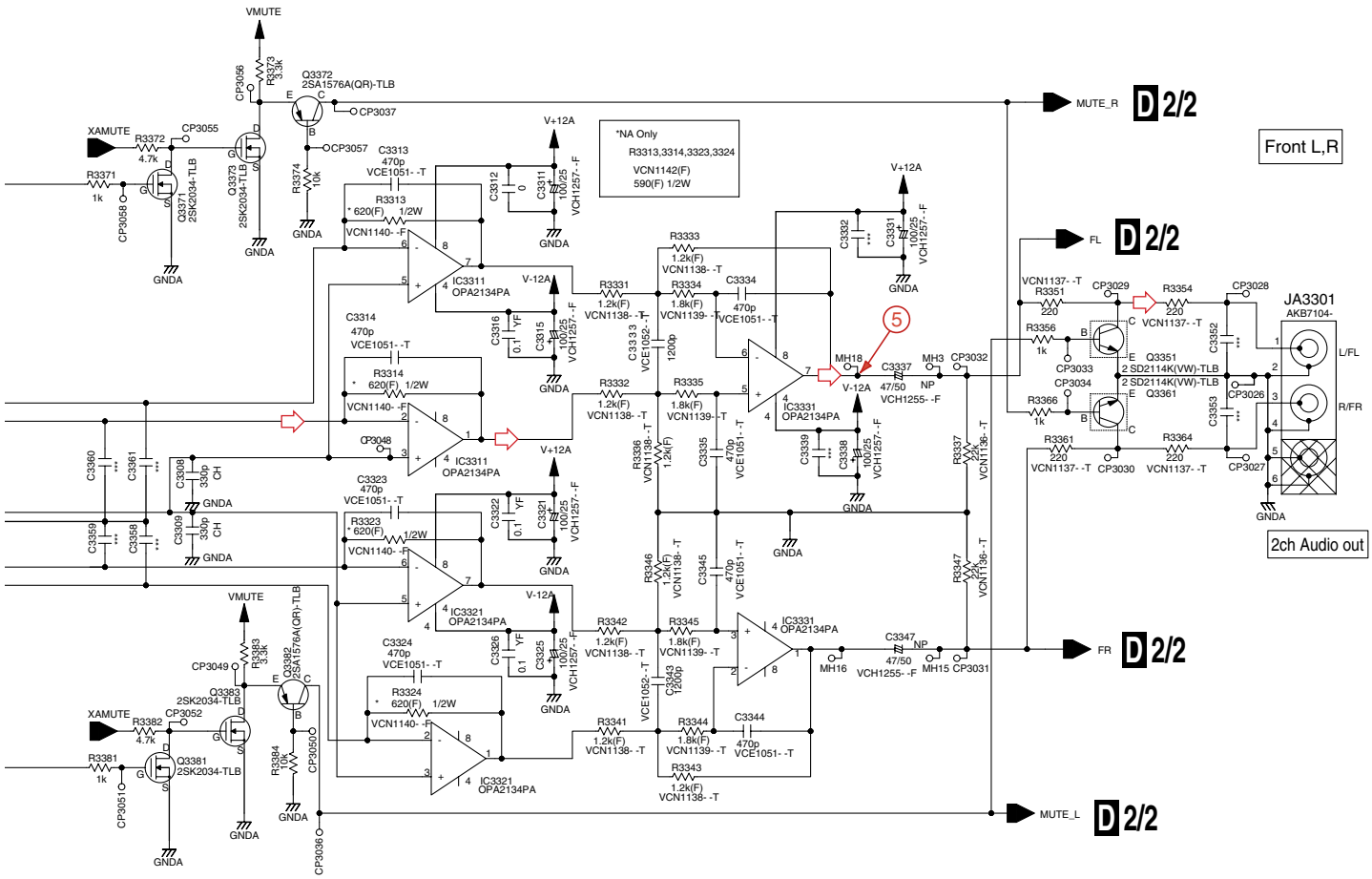
MENU : S105
RETURN : S107
HOME MENU : S109
TOP MENU : S111
►► ►▌ : S113
▐◄◄ ◄◄ : S115
STOP : S117

FLKY ASSY : KEY 3

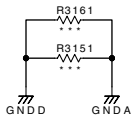
PLAY : S106
⇑ : S108
⇒ : S110
ENTER : S112
⇓ : S114
⇐ : S116

D 1/2 AUJB ASSY(1/2)(VWG2578)





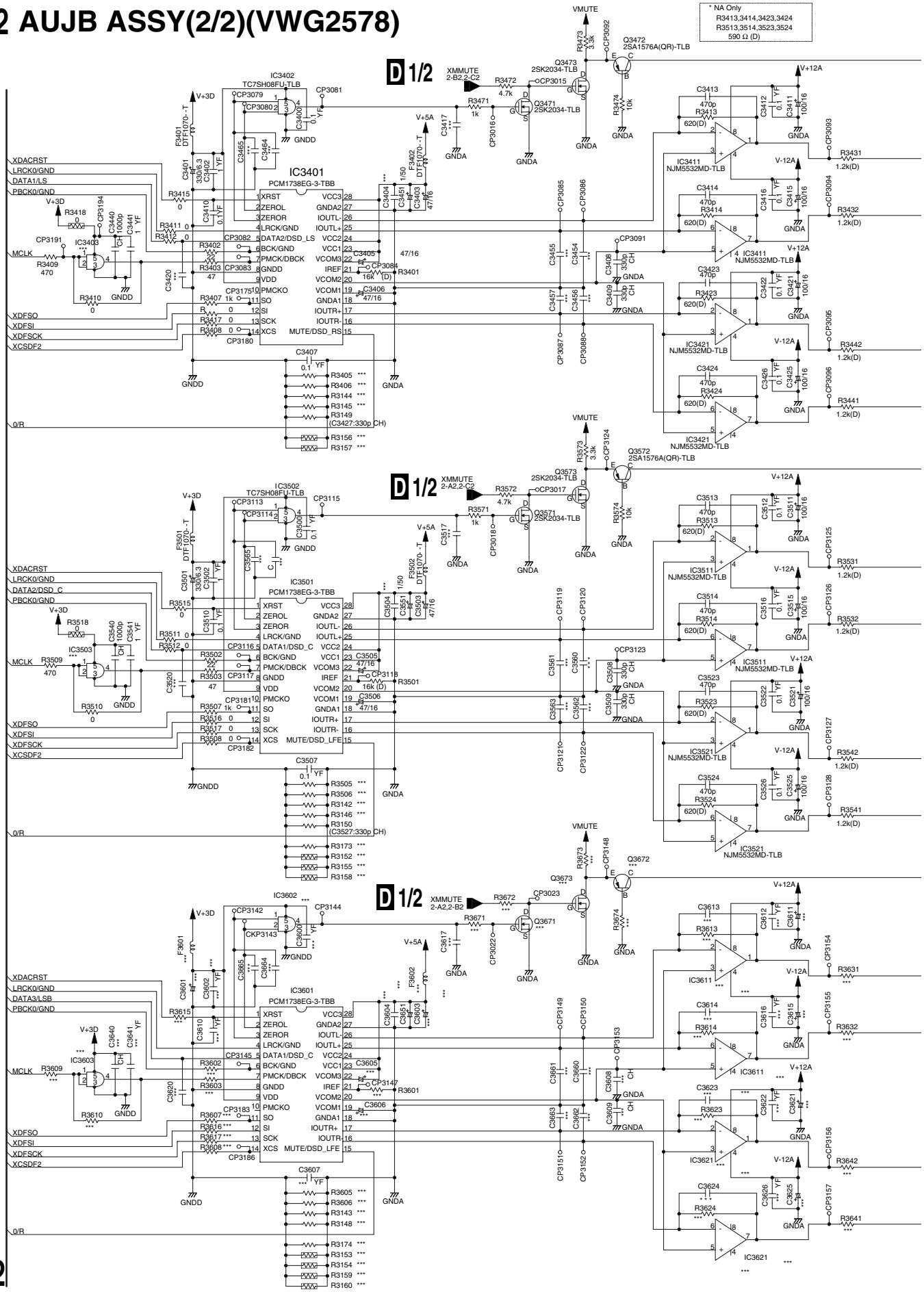
: AUDIO SIGNAL ROUTE

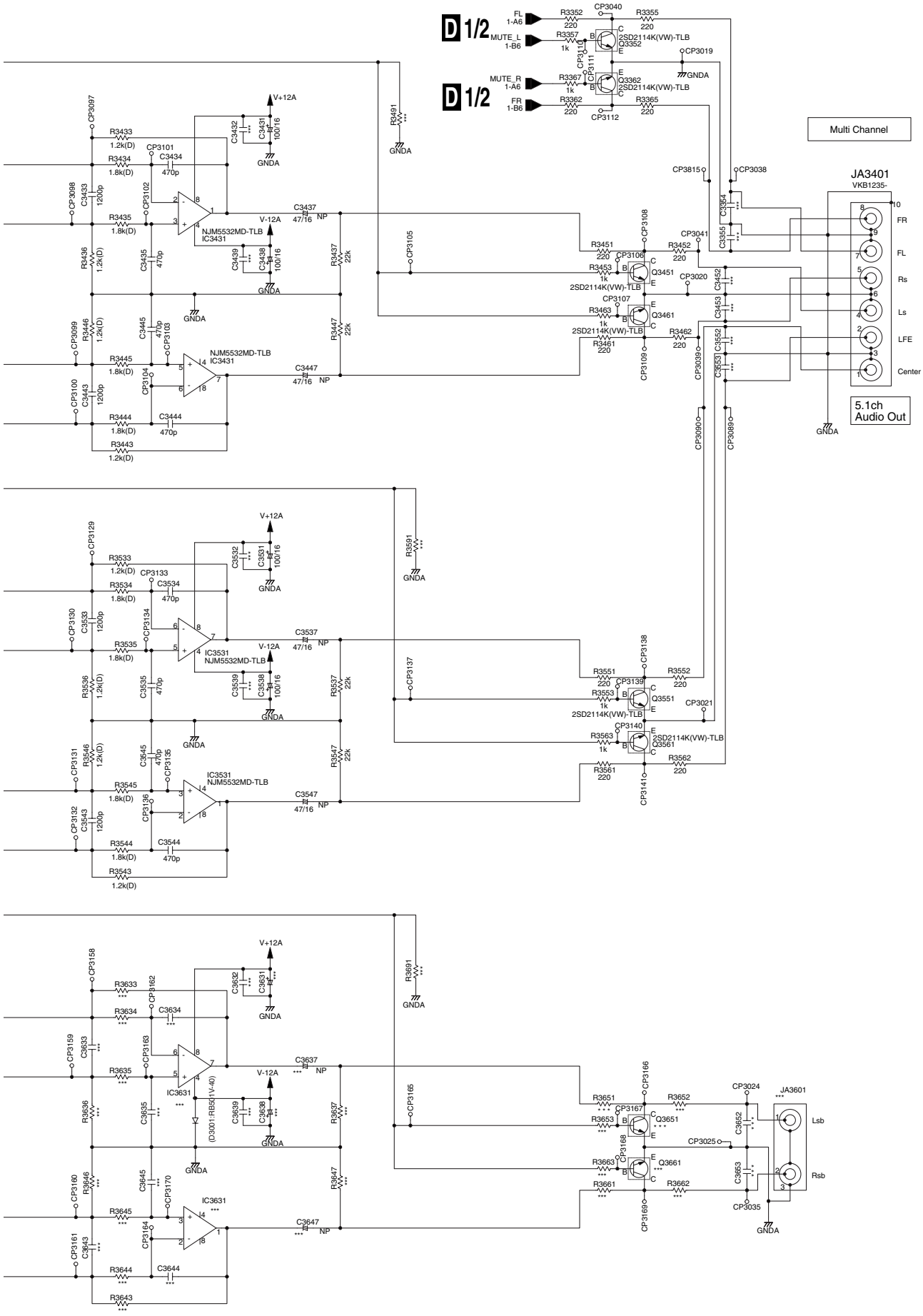


D 1/2

3.13 AUJB ASSY 2/2

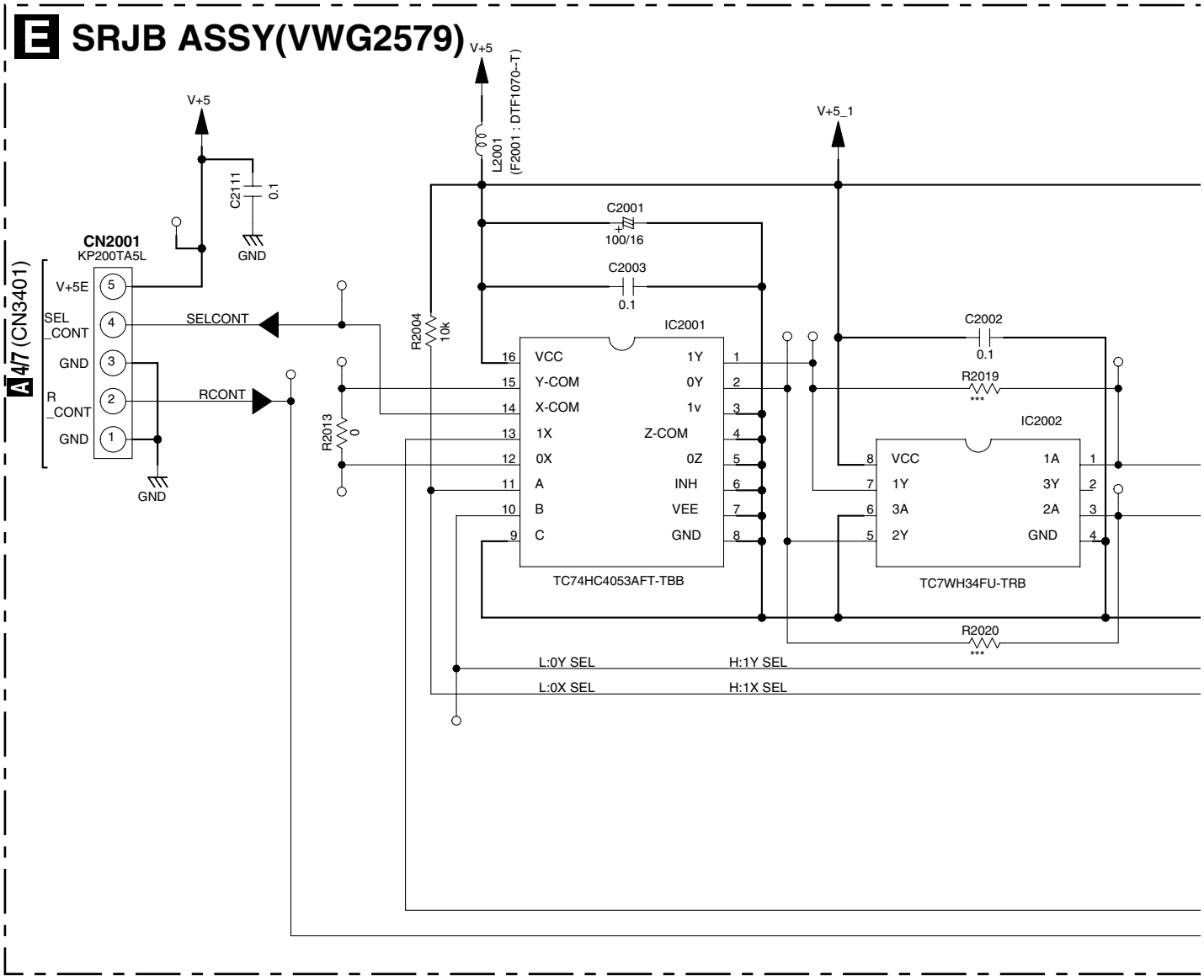
D 2/2 AUJB ASSY(2/2)(VWG2578)

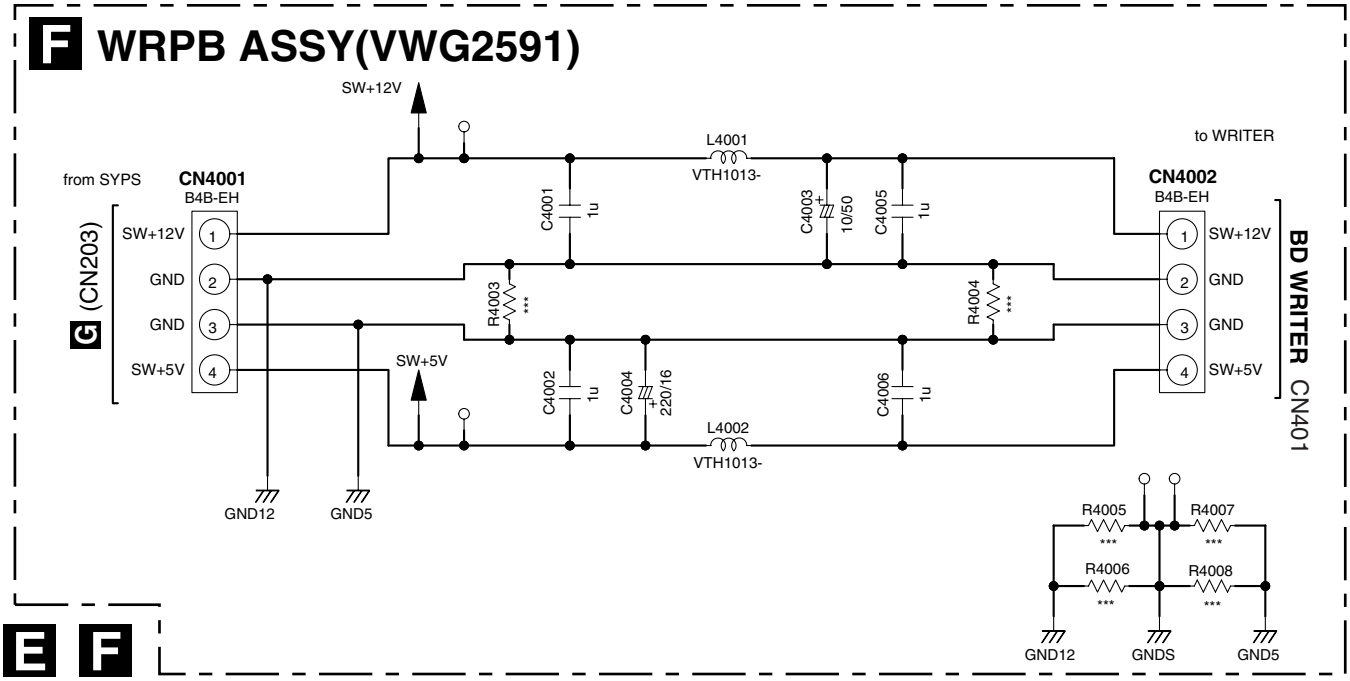



D 1/2
FL
1-A6
MUTE_L
1-B6
R3352
220
CP3040
R3355
220
R3357
1k
CP3110
CP3111
2SD2114K(VW)-TLB
Q3352
CP3019
GNDA
D 1/2
MUTE_R
1-A6
FR
1-B6
R3367
1k
Q3362
2SD2114K(VW)-TLB
R3362
220
CP3112
R3365
220
Multi Channel
JA3401
VKB1235-
FR
FL
Rs
Ls
LFE
Center
5.1ch
Audio Out
CP3815
CP3038
CP3097
CP3098
CP3099
CP3100
CP3101
CP3102
CP3103
CP3104
CP3105
CP3106
CP3107
CP3108
CP3109
CP3020
CP3039
CP3041
CP3089
CP3090
V+12A
V-12A
GNDA
R3433
1.2k(D)
R3434
1.8k(D)
C3434
470p
C3431
100/16
C3432
R3435
1.8k(D)
C3433
1200p
C3435
470p
C3436
1.2k(D)
C3437
47/16
NP
C3438
100/16
C3439
R3437
22k
NJM5532MD-TLB
IC3431
R3443
1.2k(D)
R3444
1.8k(D)
C3444
470p
C3443
1200p
C3445
470p
C3446
1.2k(D)
R3445
1.8k(D)
C3447
47/16
NP
R3447
22k
R3491
R3451
220
R3452
220
R3453
1k
Q3451
2SD2114K(VW)-TLB
R3461
220
R3462
220
R3463
1k
Q3461
2SD2114K(VW)-TLB
C3452
C3453
C3454
C3455
C3552
C3553
CP3129
CP3130
CP3131
CP3132
CP3133
CP3134
CP3135
CP3136
CP3137
CP3138
CP3139
CP3140
CP3141
CP3021
R3533
1.2k(D)
R3534
1.8k(D)
C3534
470p
C3531
100/16
C3532
R3535
1.8k(D)
C3533
1200p
C3535
470p
C3536
1.2k(D)
C3537
47/16
NP
C3538
100/16
C3539
R3537
22k
IC3531
NJM5532MD-TLB
R3543
1.2k(D)
R3544
1.8k(D)
C3544
470p
C3543
1200p
C3545
470p
C3546
1.2k(D)
R3545
1.8k(D)
C3547
47/16
NP
R3547
22k
R3591
R3551
220
R3552
220
R3553
1k
Q3551
2SD2114K(VW)-TLB
R3561
220
R3562
220
R3563
1k
Q3561
2SD2114K(VW)-TLB
CP3158
CP3159
CP3160
CP3161
CP3162
CP3163
CP3164
CP3165
CP3166
CP3167
CP3168
CP3169
CP3170
CP3024
CP3025
CP3035
JA3601
Lsb
Rsb
R3633
R3634
C3634
C3631
C3632
R3635
C3633
C3635
C3636
C3637
C3638
C3639
R3637
IC3631
(D3001:RB511V-40)
R3643
R3644
C3644
C3643
C3645
C3646
R3645
C3647
R3647
R3691
R3651
R3652
R3653
Q3651
R3661
R3662
R3663
Q3661
C3652
C3653

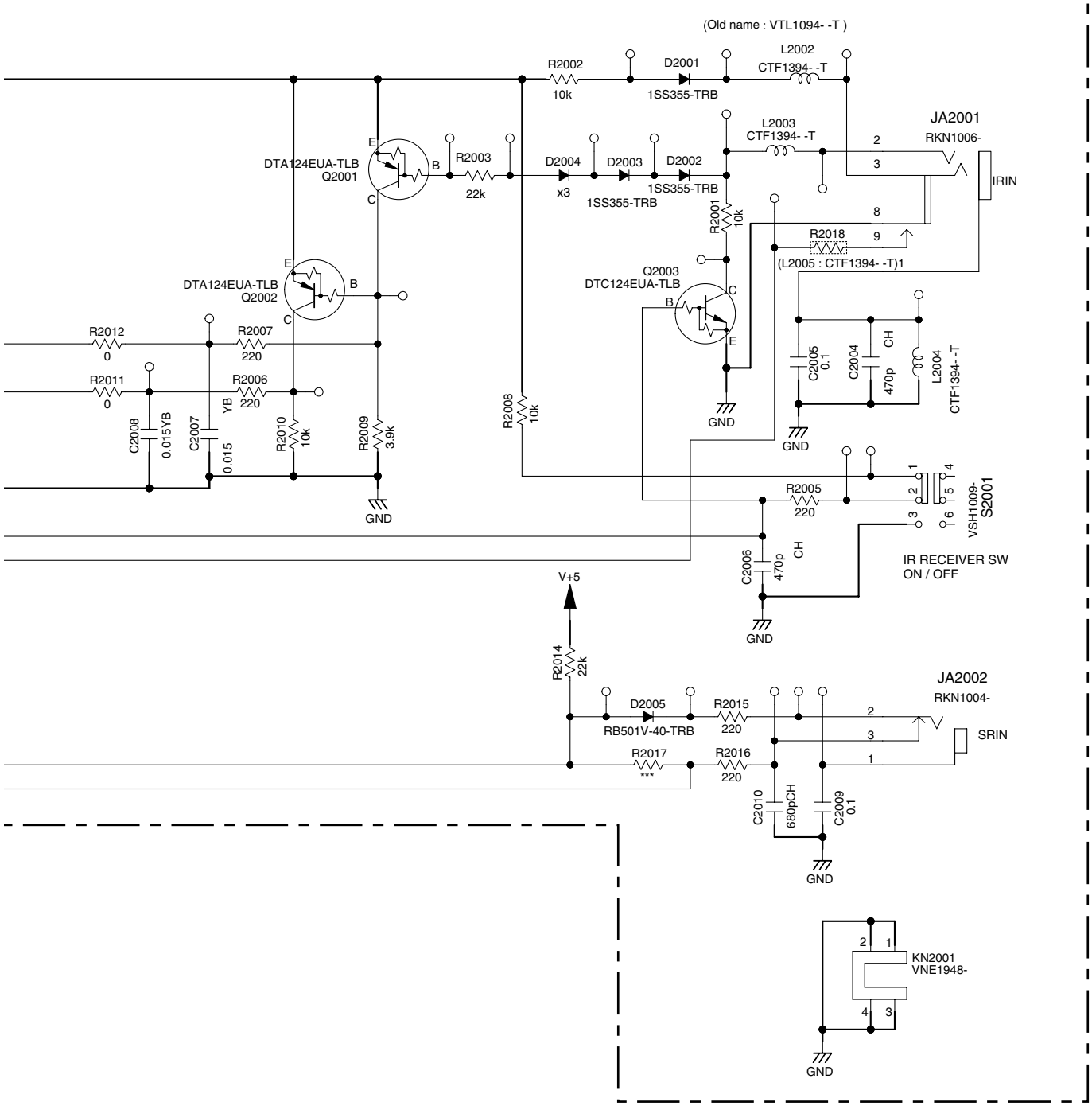
D 2/2

3.14 SRJB and WRPB ASSYS





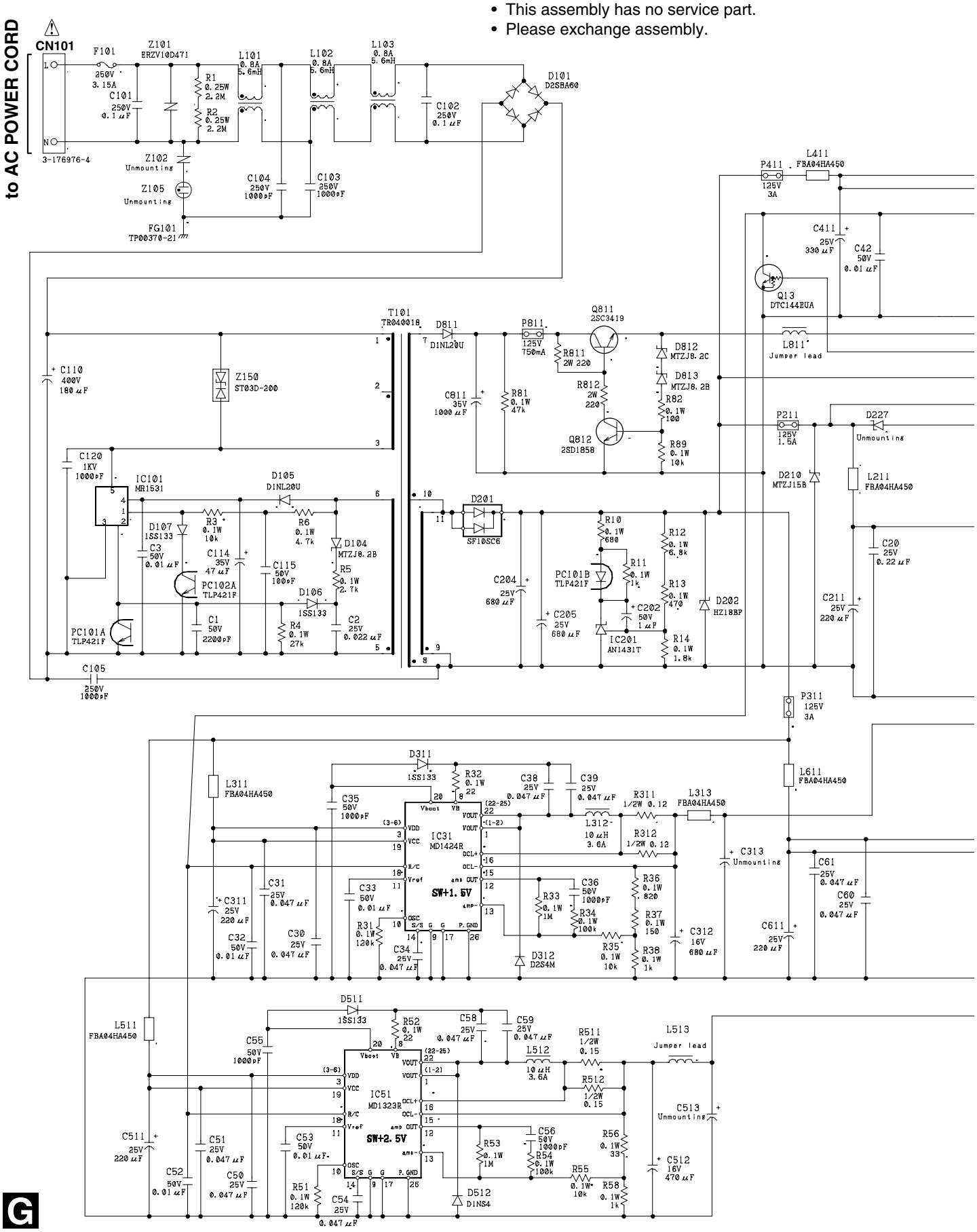
E F

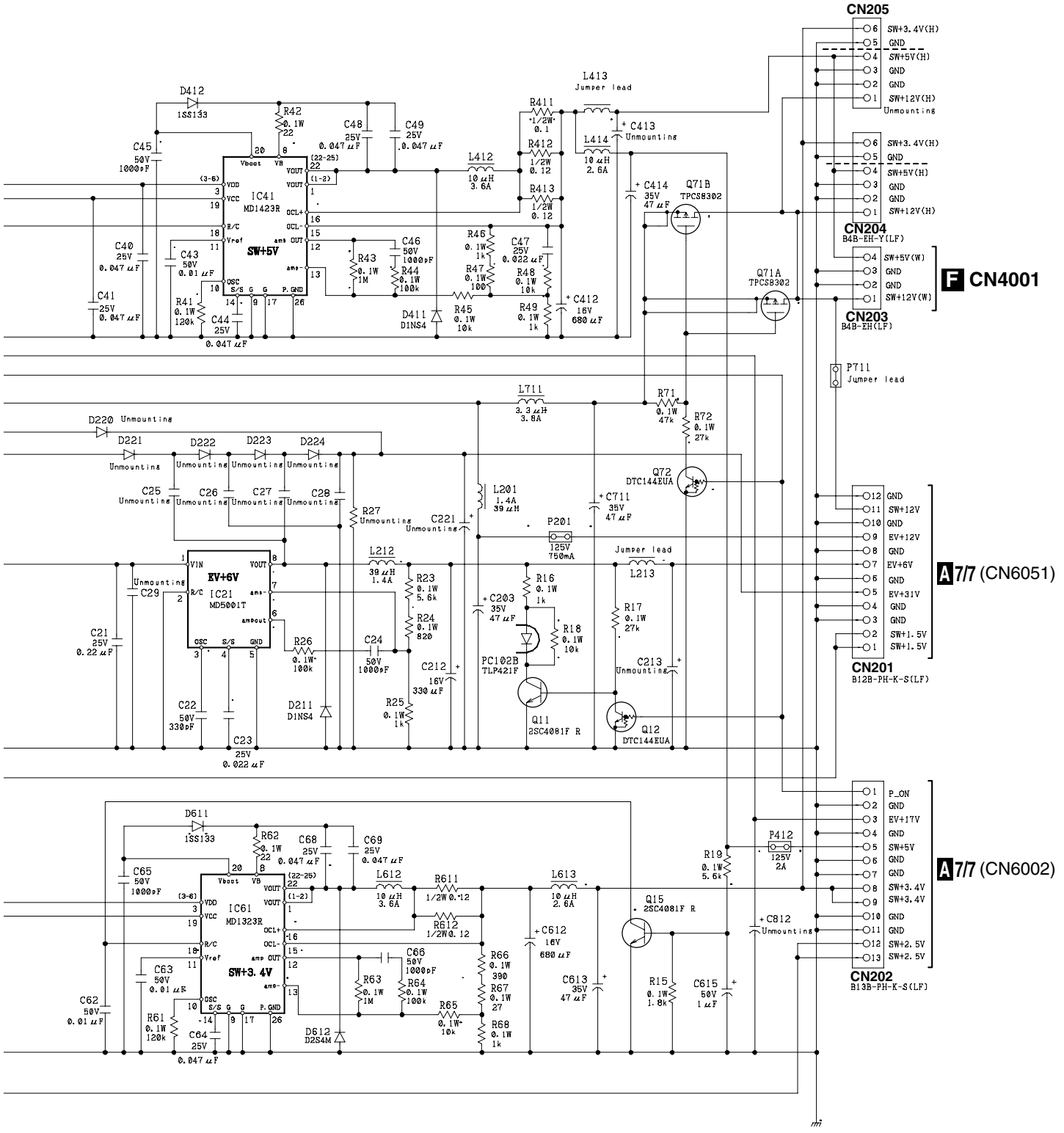

(Old name : VTL1094- -T)
R2002
10k
D2001
1SS355-TRB
L2002
CTF1394- -T
JA2001
RKN1006-
L2003
CTF1394- -T
DTA124EUA-TLB
Q2001
R2003
22k
D2004
x3
D2003
D2002
1SS355-TRB
1SS355-TRB
IRIN
R2001
10k
R2018
(L2005 : CTF1394- -T)1
Q2003
DTC124EUA-TLB
DTA124EUA-TLB
Q2002
R2012
0
R2007
220
R2011
0
R2006
220
YB
C2008
0.015YB
C2007
0.015
R2010
10k
R2009
3.9k
R2008
10k
C2005
0.1
C2004
470p
CH
L2004
CTF1394- -T
GND
R2005
220
VSH1009-
S2001
C2006
470p
CH
IR RECEIVER SW
ON / OFF
V+5
R2014
22k
JA2002
RKN1004-
D2005
RB501V-40-TRB
R2015
220
SRIN
R2017
***
R2016
220
C2010
680pCH
C2009
0.1
KN2001
VNE1948-

G SYPS ASSY(VWR1402)

[Figure of reference]

- This assembly has no service part.
- Please exchange assembly.



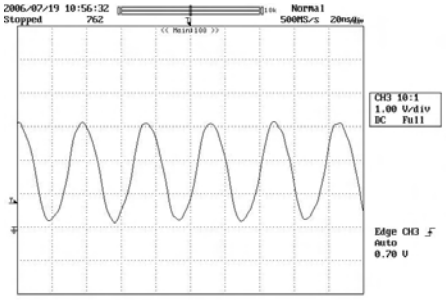

CN205
SW+3.4V(H)
GND
SW+5V(H)
GND
GND
SW+12V(H)
Unmounting
CN204
B4B-EH-Y(LF)
SW+5V(W)
GND
GND
SW+12V(W)
F CN4001
CN203
B4B-EH(LF)
IC41
MD1423R
SW+5V
IC21
MD5001T
EV+6V
IC61
MD1323R
SW+3.4V
Q71B
TPCS8302
Q71A
TPCS8302
Q72
DTC144EUA
Q11
2SC4081F R
Q12
DTC144EUA
Q15
2SC4081F R
PC102B
TLP421F
P711
Jumper lead
P201
125V
750mA
P412
125V
2A
A 7/7 (CN6051)
CN201
B12B-PH-K-S(LF)
GND
SW+12V
GND
EV+12V
GND
EV+6V
GND
EV+31V
GND
GND
SW+1.5V
SW+1.5V
A 7/7 (CN6002)
CN202
B13B-PH-K-S(LF)
P_ON
GND
EV+17V
GND
SW+5V
GND
GND
SW+3.4V
SW+3.4V
GND
GND
SW+2.5V
SW+2.5V
D412
1SS133
D611
1SS133
D220 Unmounting
D221 Unmounting
D222 Unmounting
D223 Unmounting
D224 Unmounting
D411
D1NS4
D211
D1NS4
D612
D2S4M
L413
Jumper lead
L711
3.3 μH
3.8A
L201
1.4A
39 μH
L212
39 μH
1.4A
L412
10 μH
3.6A
L414
10 μH
2.6A
L612
10 μH
3.6A
L613
10 μH
2.6A
R411
1/2W
0.1
R412
1/2W
0.12
R413
1/2W
0.12
R611
1/2W 0.12
R612
1/2W 0.12
R42
0.1W
22
R43
0.1W
1M
R44
0.1W
100k
R45
0.1W
10k
R46
0.1W
1k
R47
0.1W
100
R48
0.1W
10k
R49
0.1W
1k
R41
0.1W
120k
R61
0.1W
120k
R62
0.1W
22
R63
0.1W
1M
R64
0.1W
100k
R65
0.1W
10k
R66
0.1W
390
R67
0.1W
27
R68
0.1W
1k
R71
0.1W
47k
R72
0.1W
27k
R16
0.1W
1k
R17
0.1W
27k
R18
0.1W
10k
R19
0.1W
5.6k
R23
0.1W
5.6k
R24
0.1W
820
R25
0.1W
1k
R26
0.1W
100k
R27
Unmounting
R15
0.1W
1.8k
C40
25V
0.047 μF
C41
25V
0.047 μF
C43
50V
0.01 μF
C44
25V
0.047 μF
C45
50V
1000pF
C46
50V
1000pF
C47
25V
0.022 μF
C48
25V
0.047 μF
C49
25V
0.047 μF
C412
16V
680 μF
C413
Unmounting
C414
35V
47 μF
C711
35V
47 μF
C203
35V
47 μF
C212
16V
330 μF
C213
Unmounting
C221
Unmounting
C21
25V
0.22 μF
C22
50V
330pF
C23
25V
0.022 μF
C24
50V
1000pF
C25
Unmounting
C26
Unmounting
C27
Unmounting
C28
Unmounting
C29
Unmounting
C62
50V
0.01 μF
C63
50V
0.01 μF
C64
25V
0.047 μF
C65
50V
1000pF
C66
50V
1000pF
C68
25V
0.047 μF
C69
25V
0.047 μF
C612
16V
680 μF
C613
35V
47 μF
C615
50V
1 μF
C812
Unmounting
Jumper lead
L213
Vbaat
VB
VDD
VCC
R/C
Vref
amp OUT
amp-
OCL+
OCL-
VOUT
VOUT
OSC
S/S
G
P. GND
VIN
R/C
amp-
ampout
GND
SW+5V
SW+3.4V

3.16 WAVEFORMS

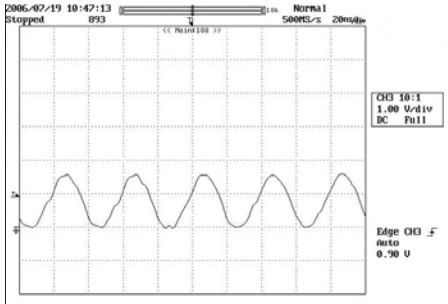
A MAIN ASSY

Note: The numbers for the waveform photos (circled) are identical to those for the schematic diagrams, PCB diagrams, and troubleshooting flowcharts.

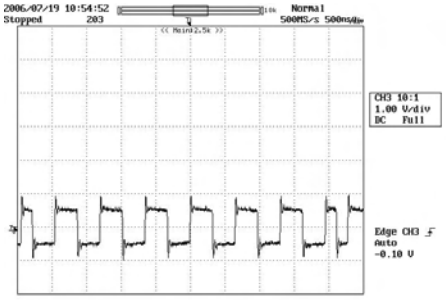
1 27.00MHz CLOCK
X1001 1pin
P-ON



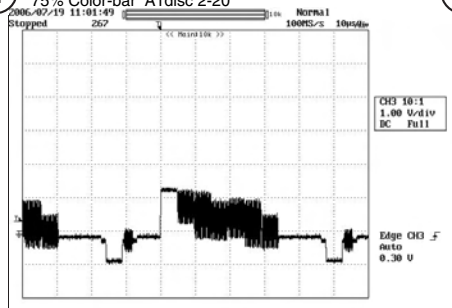
2 25.000MHz CLOCK
X3001 1pin
P-ON



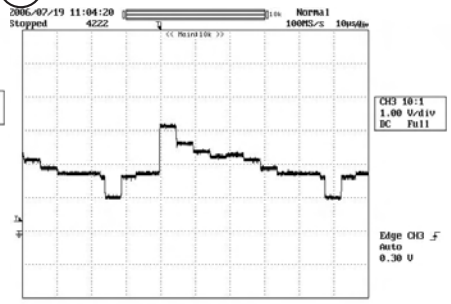
3 CoAxial out
1KHz 2Vrms A1disc 2-1



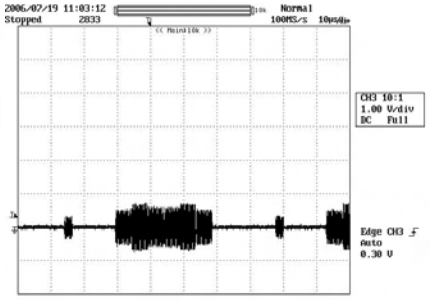
4 Video OUT
75% Color-bar A1disc 2-20



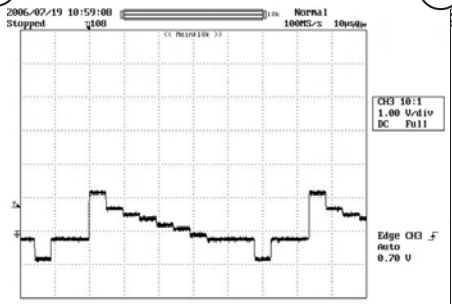
5 Y OUT
75% Color-bar A1disc 2-20



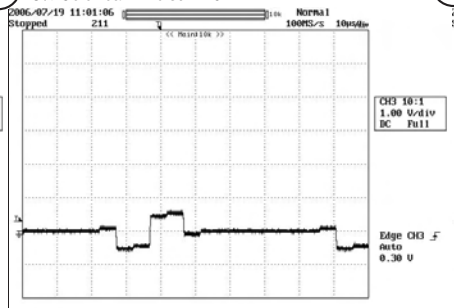
6 C OUT
75% Color-bar A1disc 2-20



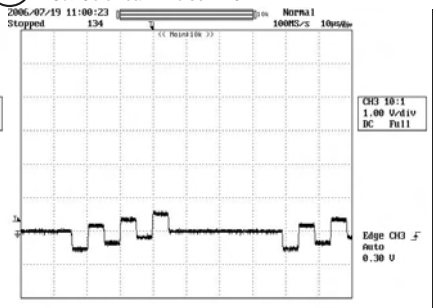
7 Conponent Y OUT
75% Color-bar A1disc 2-20



8 Cb OUT
75% Color-bar A1disc 2-20



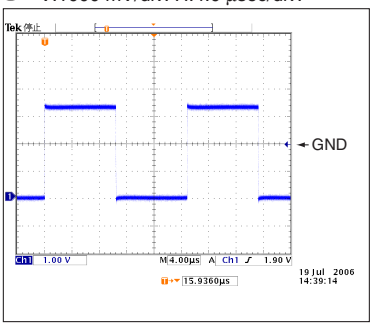
9 Cr OUT
75% Color-bar A1disc 2-20



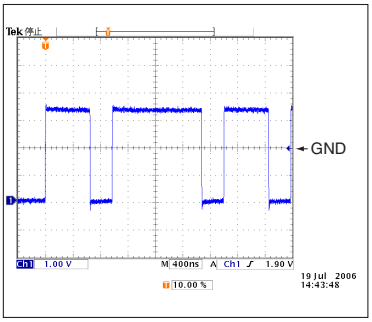
D AUJB ASSY

Note: The numbers for the waveform photos (circled) are identical to those for the schematic diagrams, PCB diagrams, and troubleshooting flowcharts.

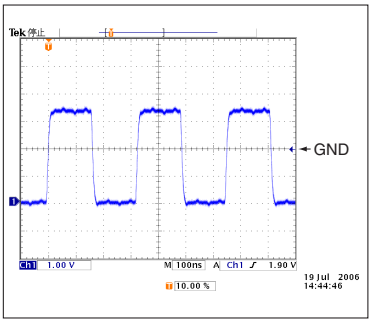
1 **IC3301-pin4 (LRCK)** **DC MODE**
V:1000 mV/div. H:4.0 µsec/div.



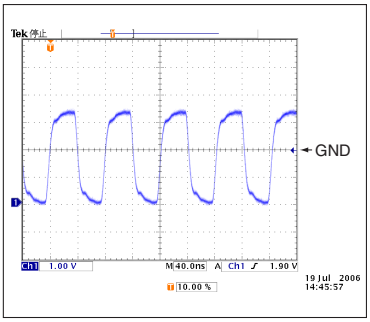
2 **IC3301-pin5 (DATA)** **DC MODE**
V:1000 mV/div. H:0.4 µsec/div.



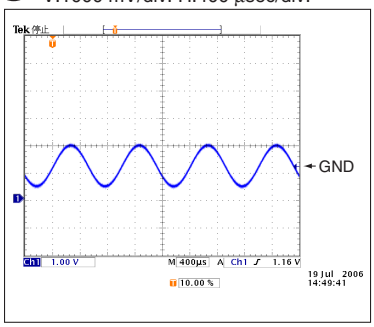
3 **IC3301-pin6 (BCK)** **DC MODE**
V:1000 mV/div. H:100nsec/div.



4 **IC3301-pin7 (PMCK)** **DC MODE**
V:1000 mV/div. H:40.0 nsec/div.



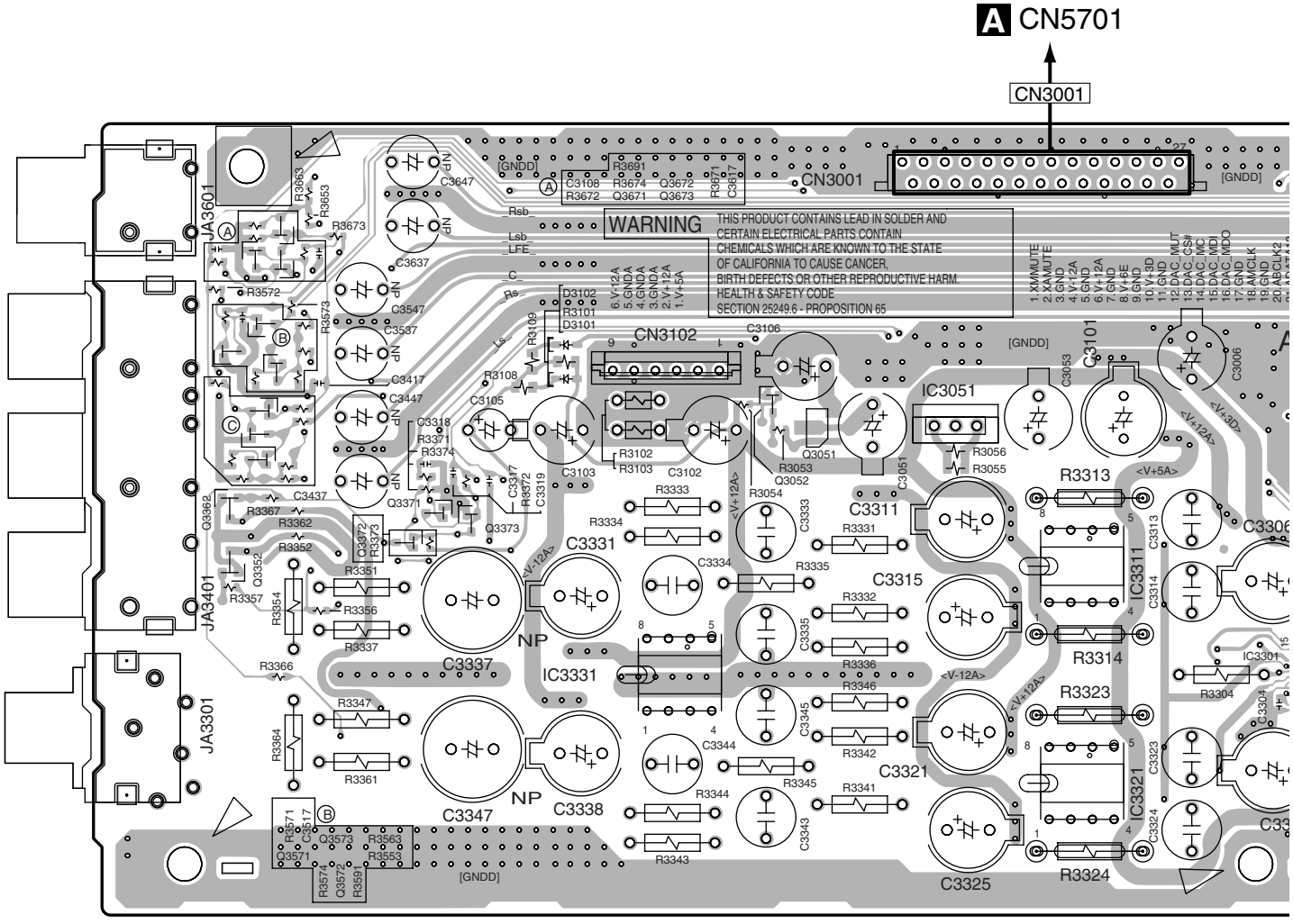
5 **IC3311-pin7 (IOUTL)** **DC MODE**
V:1000 mV/div. H:400 µsec/div.



4. PCB CONNECTION DIAGRAM
4.1 AUJB ASSY

SIDE A

D AUJB ASSY



Q3362 Q3352 Q3371 Q3373 Q3671 Q3672 Q3051 IC3051 IC3311 IC3301

Q3372 IC3331 Q3673 Q3052 IC3321

Q3573

Q3571

Q3572

D

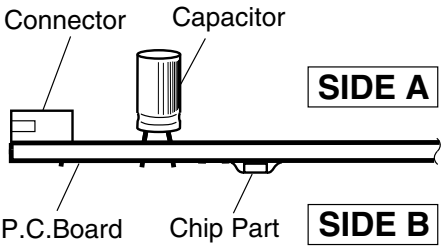
SIDE A

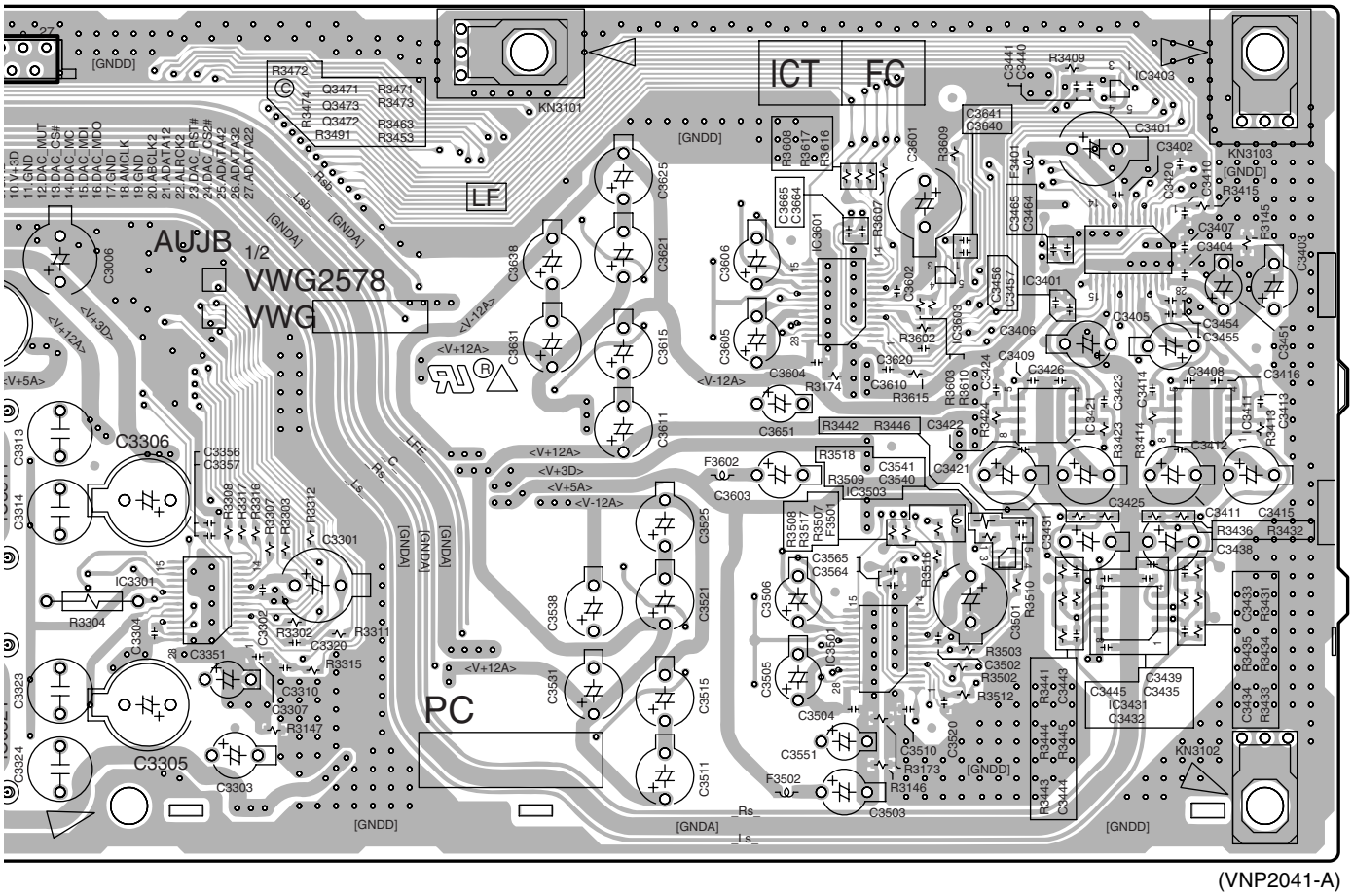
NOTE FOR PCB DIAGRAMS :

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destinations.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



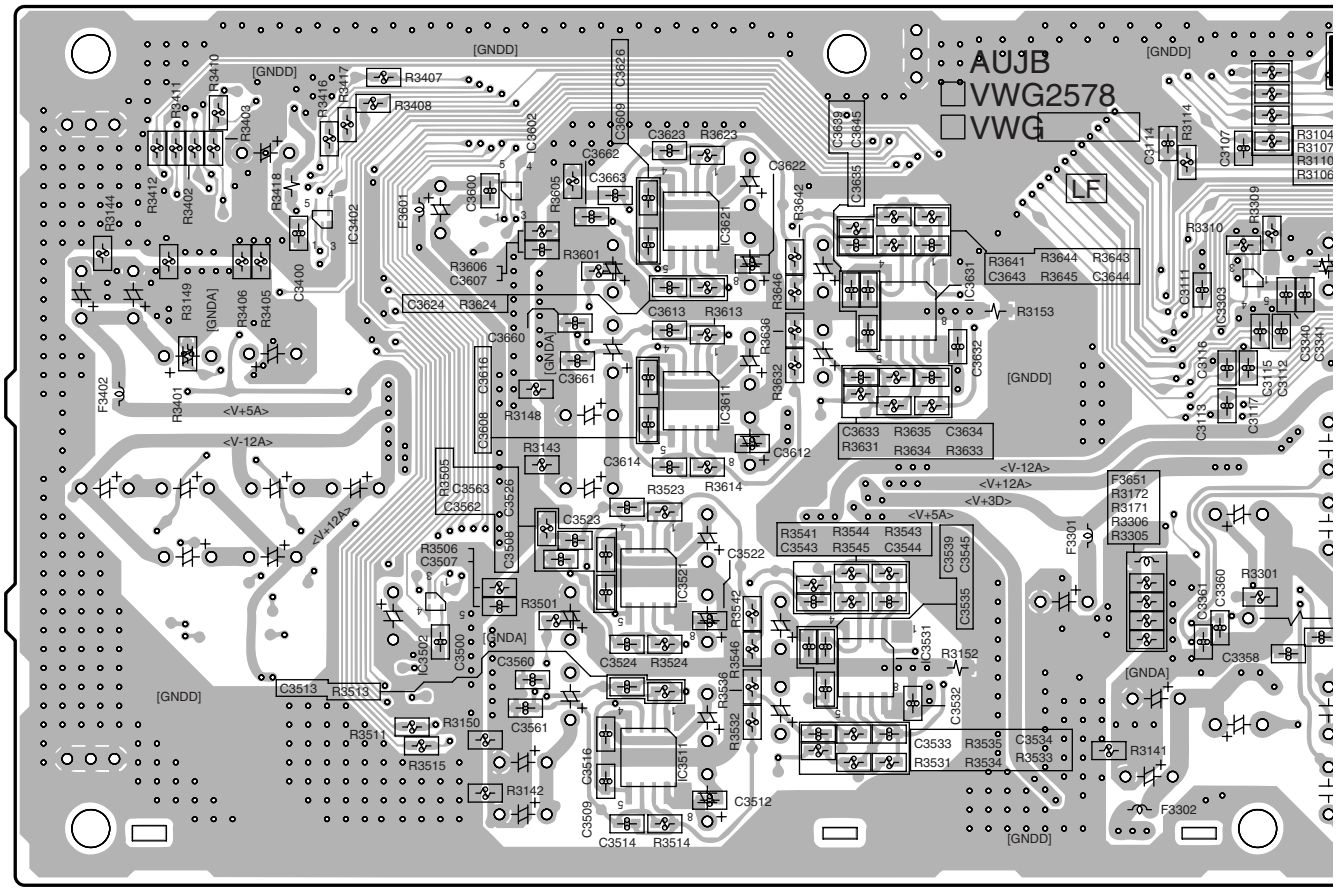


(VNP2041-A)

311	IC3301	Q3471	IC3601	IC3603	IC3401	IC3403	IC3411	
321		Q3473	IC3503		IC3421			
		Q3472	IC3501		IC3431			

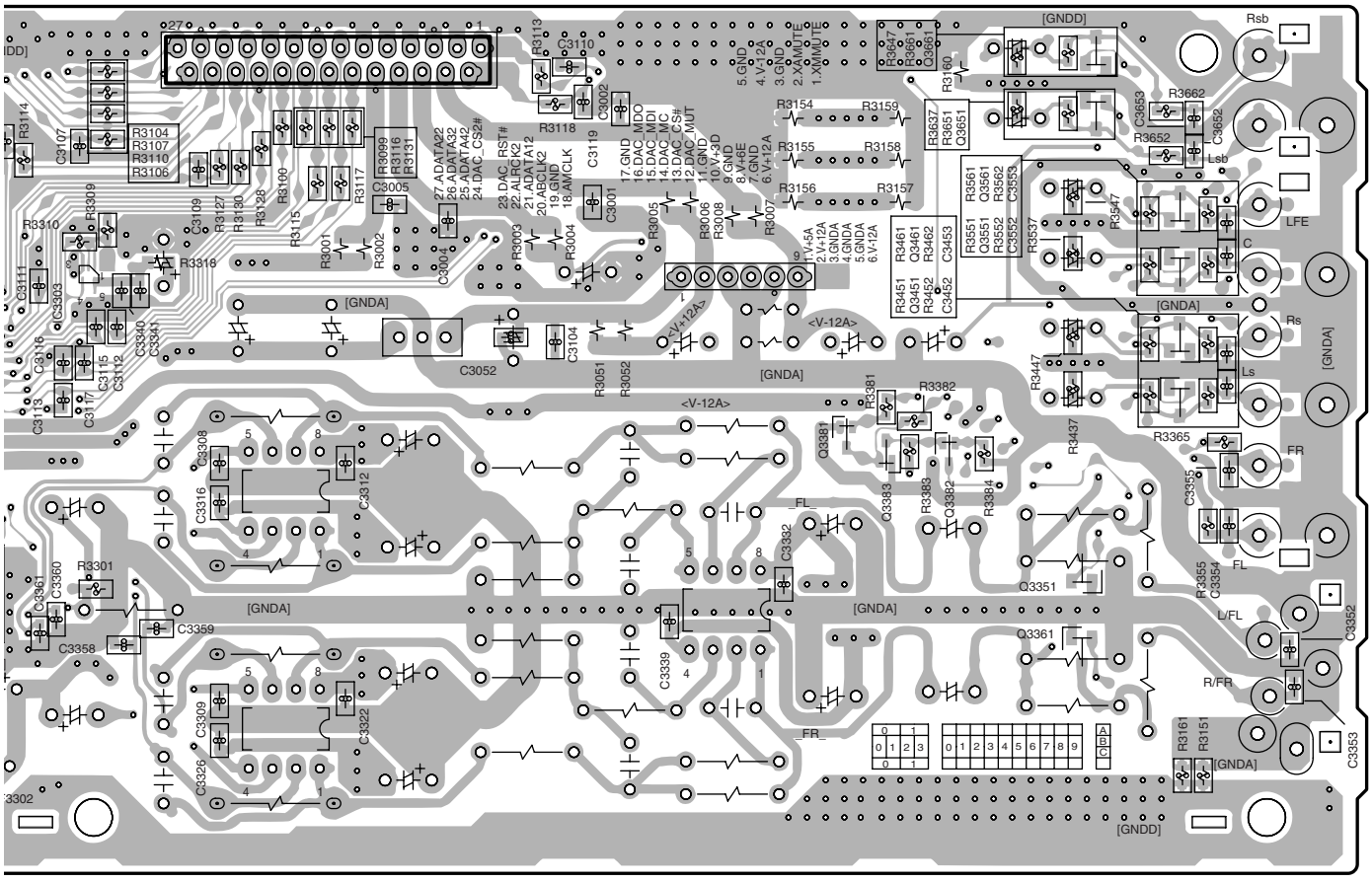
SIDE B

D AUJB ASSY



SIDE B

CN3001



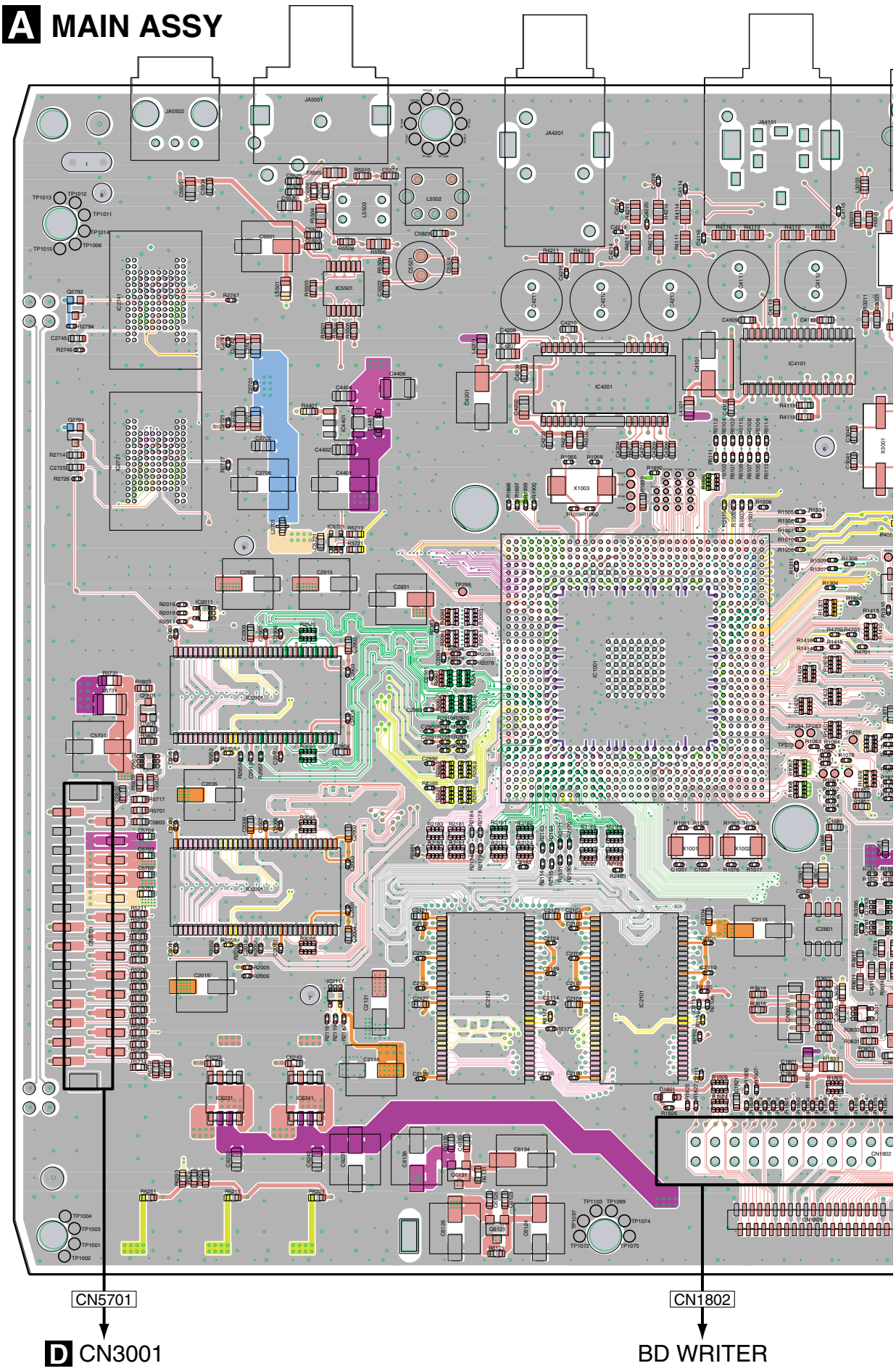
(VNP2041-A)

IC3303

Q3381 Q3661
Q3461
Q3651
Q3451 Q3561
Q3383 Q3551 Q3351
Q3382 Q3361

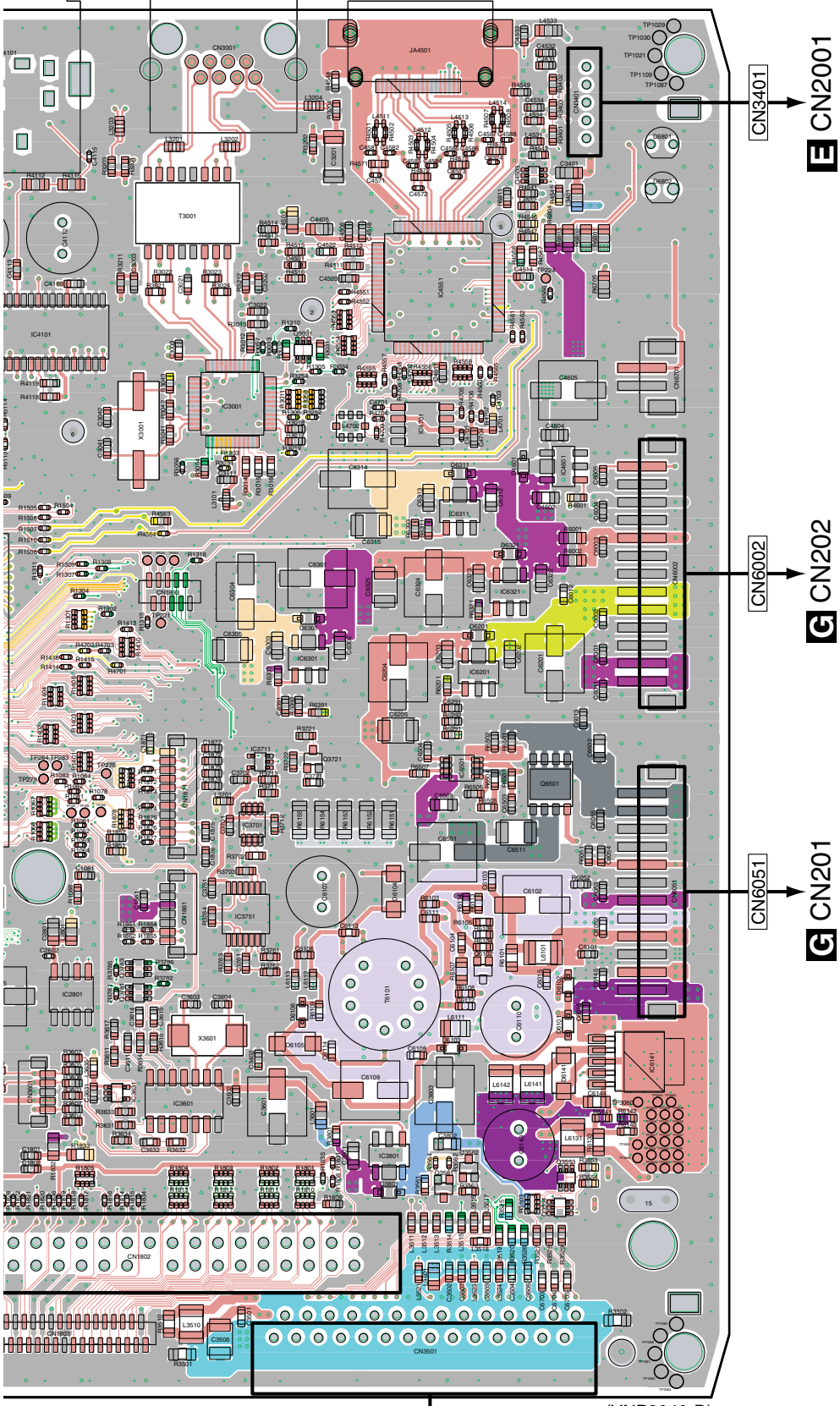
4.2 MAIN ASSY

SIDE A



SIDE A

This PCB is six layer structure.



Q4503

Q2792 IC5501 IC2741

IC4551

IC4101 Q3031

IC4201

Q2791 IC4401 IC3001 IC4701

IC2721 IC4601

IC5721 IC6311

IC6321 IC2011

IC6301 IC6201

IC1001

Q5801 IC2901

IC3711 Q3721 IC6501 Q6501

Q5802

IC3701

IC3751

IC2001 Q6102

Q3783

IC2801 Q3781

IC2111 IC6141

IC2121 IC2101 IC3631

IC3601

IC3801 Q3553 Q3562

Q3561

IC6231 IC6241 Q3554

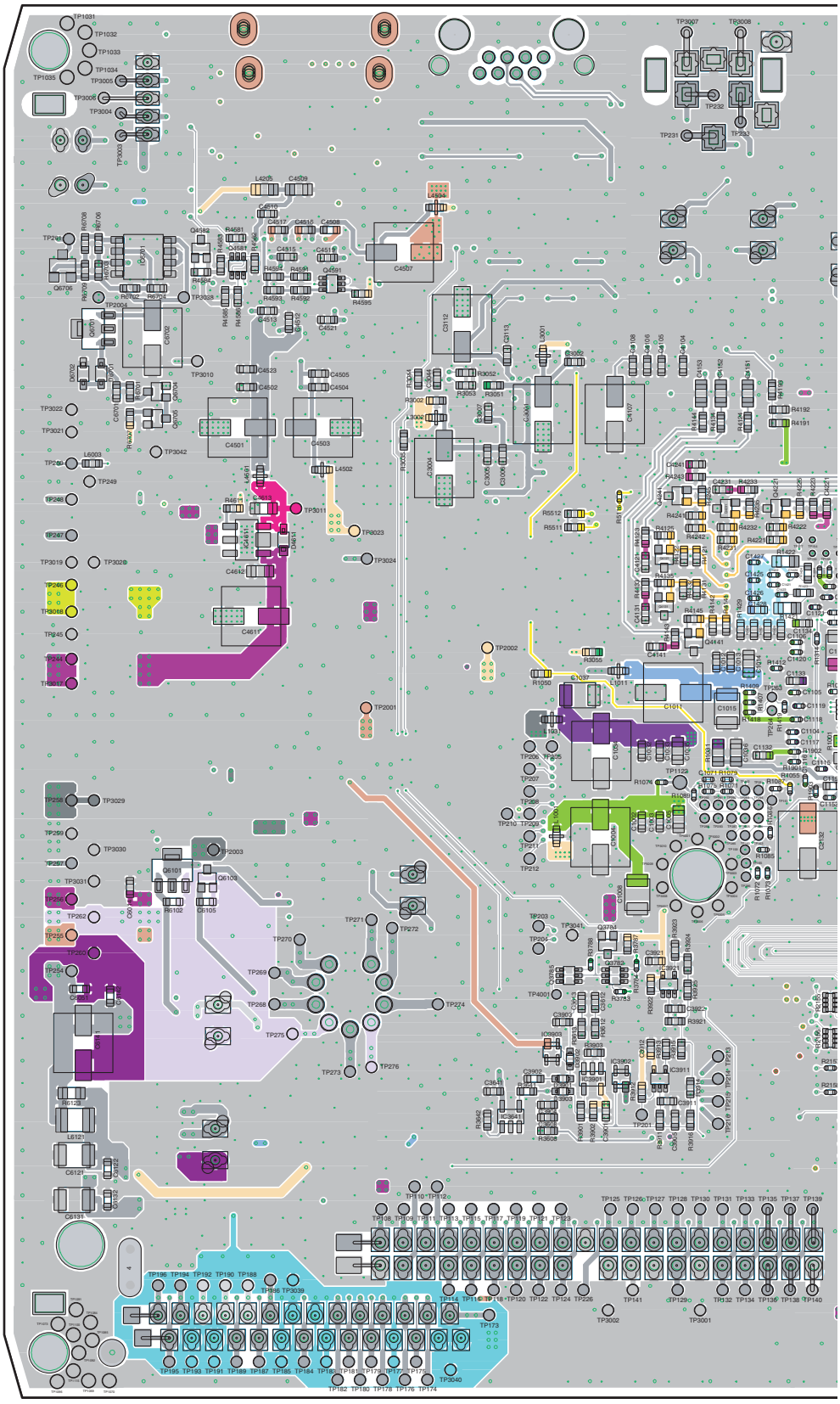
Q6131

Q6121

SIDE B

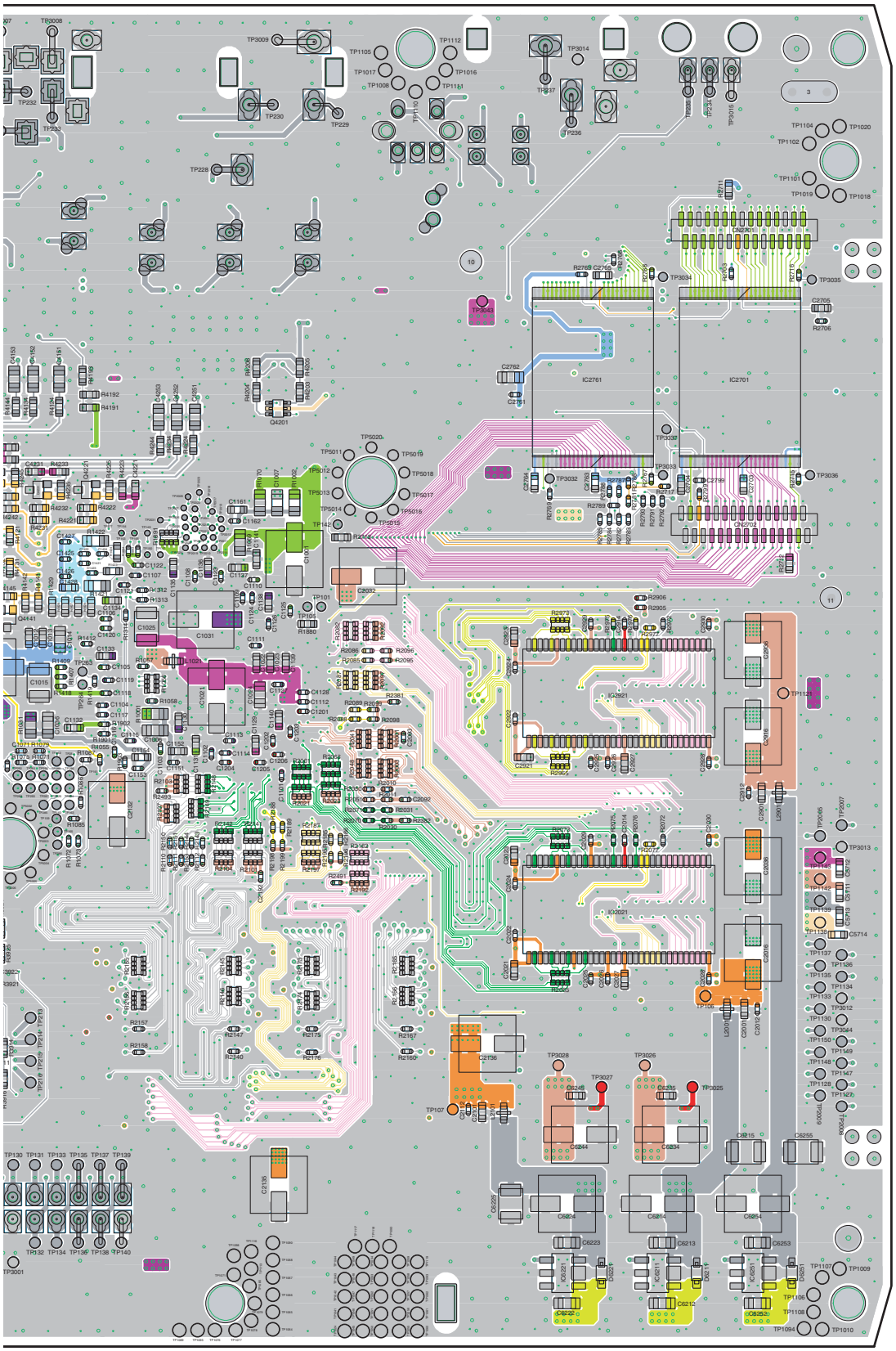
A MAIN ASSY

Q4582
Q4581
IC6701
Q4591
Q6706
Q6701
Q6704 IC2761 IC2701
Q6705
Q4201
Q4241
Q4221
Q4231
IC4611
Q4121
Q4131
Q4141
IC2921
Q6103
Q6101
Q3784
IC2021
Q3782
Q3785
IC3921
IC3903
IC3911
IC3902
IC3901
IC3641
IC6211 IC6221 IC6251



SIDE B

This PCB is six layer structure.

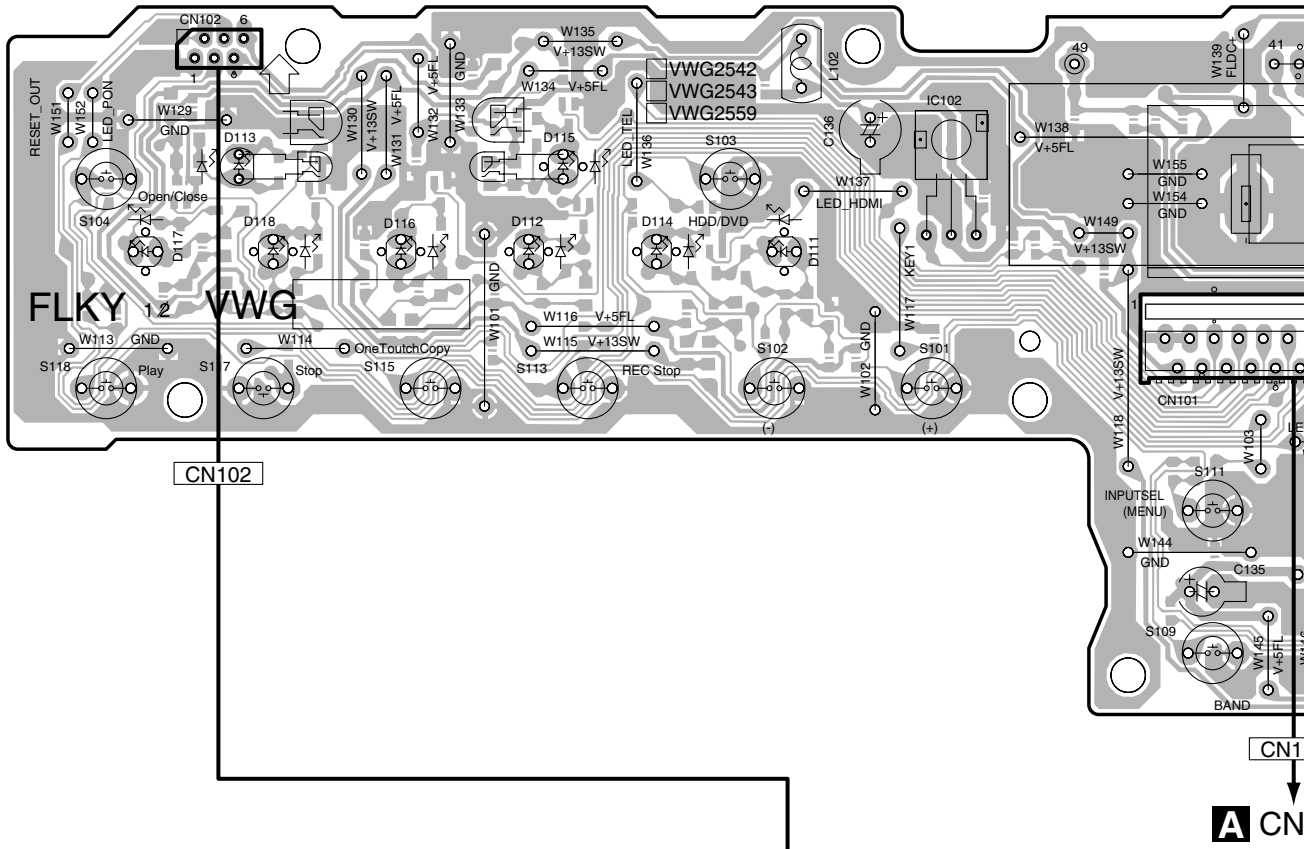


(VNP2040-D)

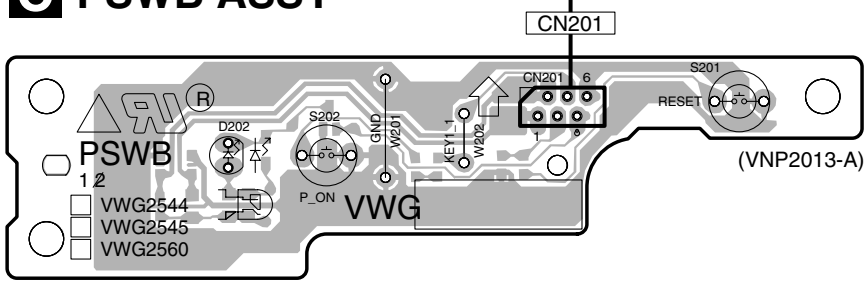
4.3 FLKY and PSWB ASSYS

SIDE A

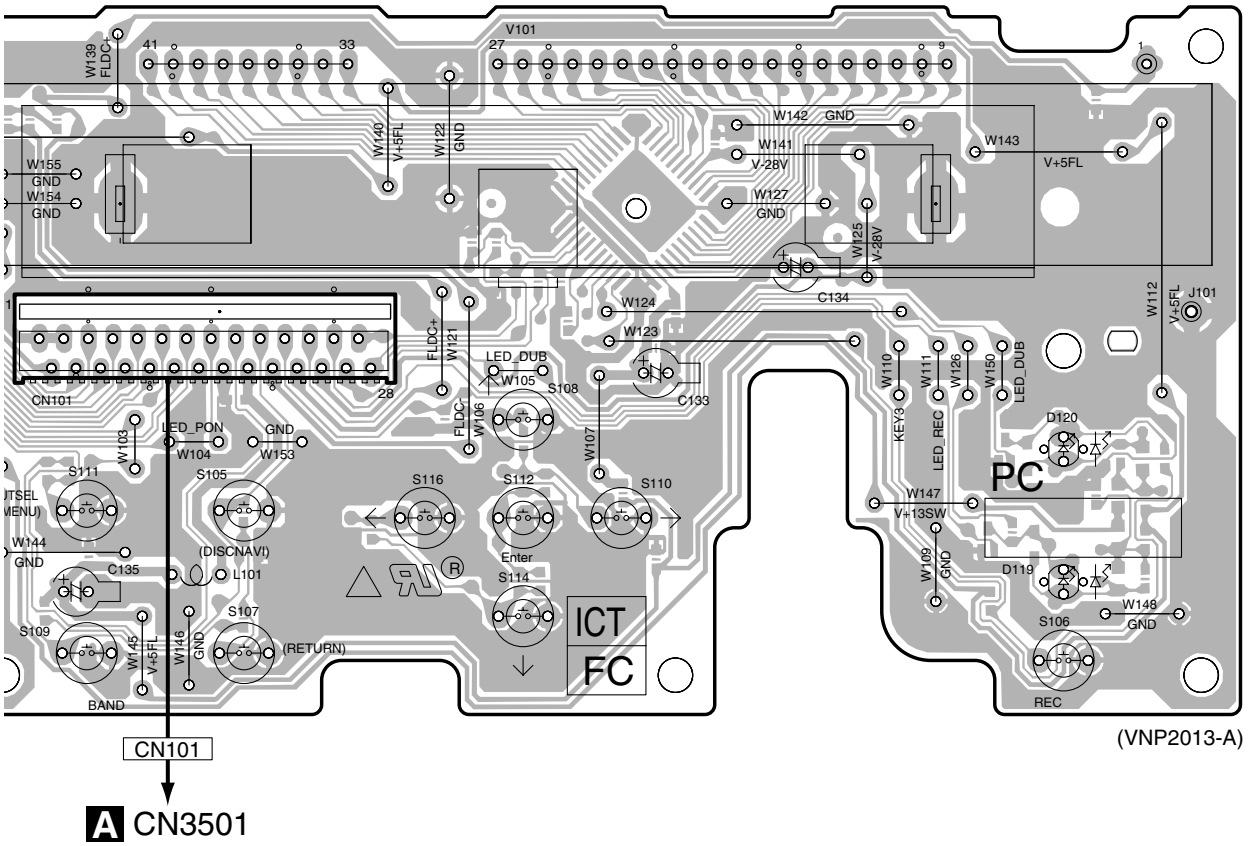
B FLKY ASSY



C PSWB ASSY

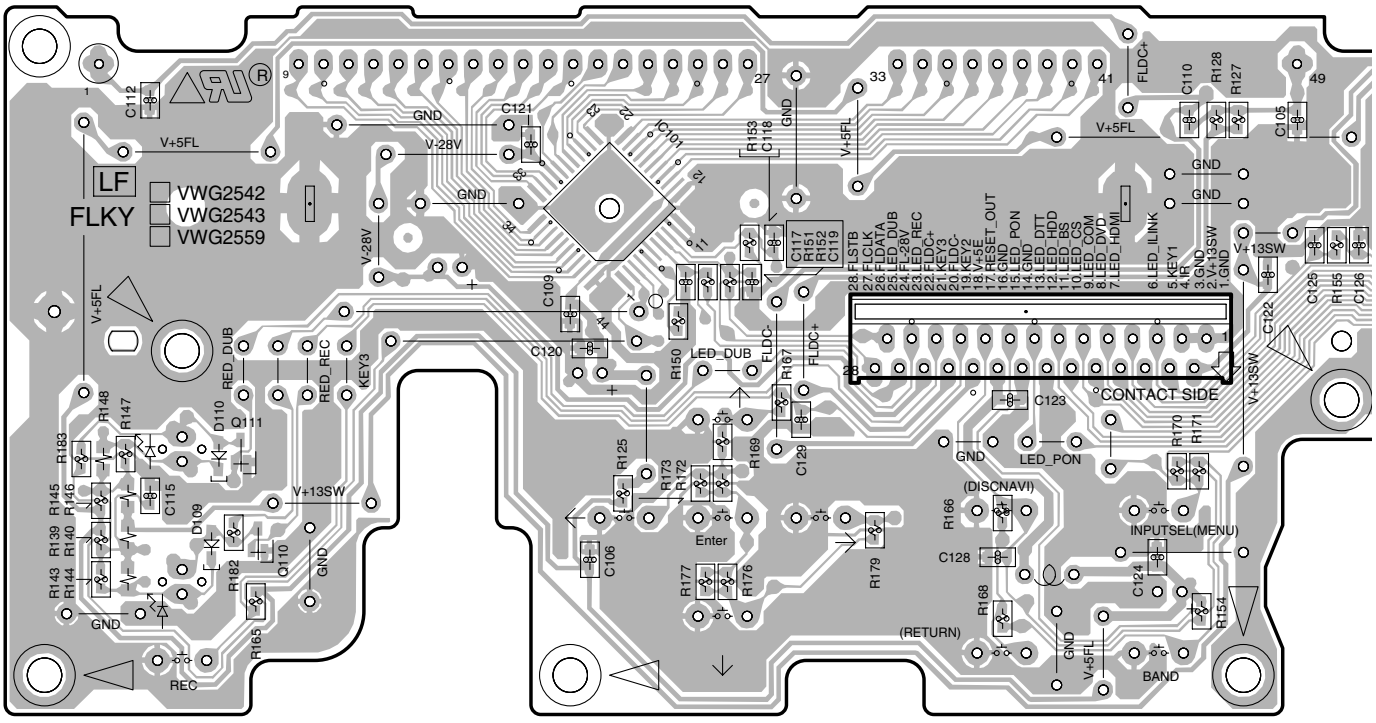


SIDE A

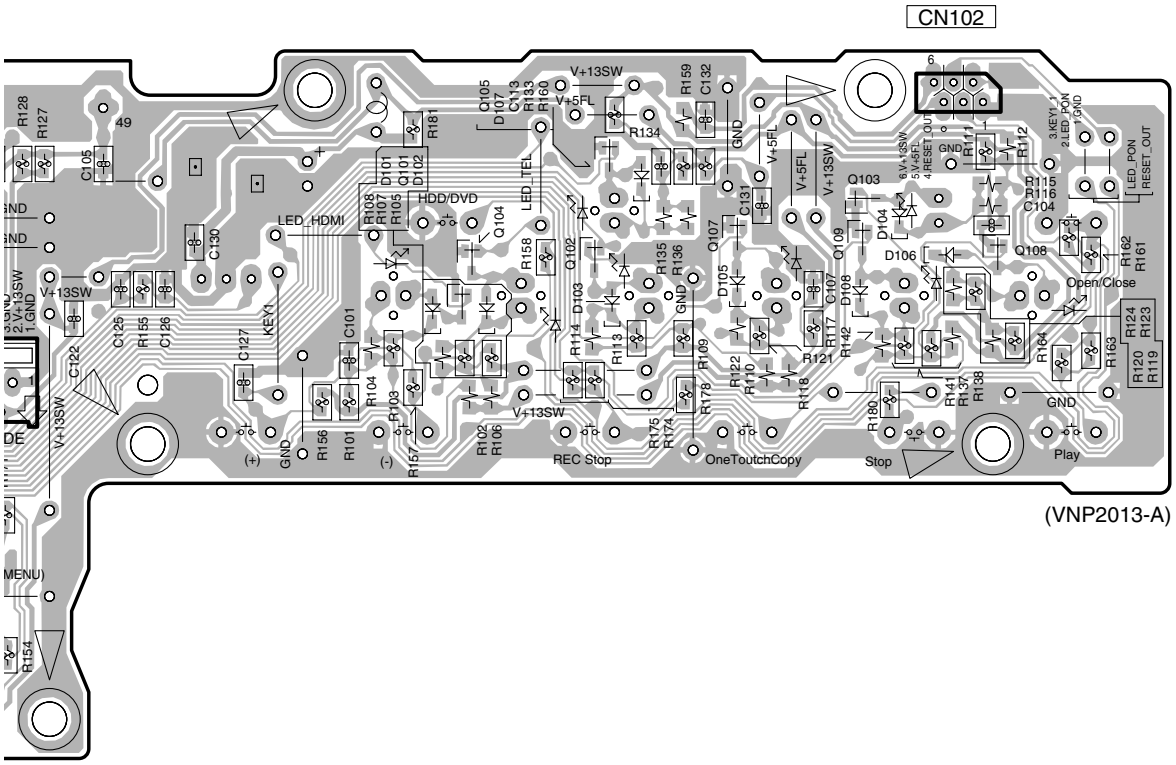

W139 FLDC+
41
33
V101
27
9
1
W140 V+5FL
W122 GND
W142 GND
W141 V-28V
W143 V+5FL
W155 GND
W154 GND
W127 GND
W125 V-28V
C134
W124
W123
J101
W112 V+5FL
FLDC+ W121
LED_DUB W105
S108
C133
CN101
28
FLDC- W106
W107
W110 KEY6
W111 LED_REC
W126
W150 LED_DUB
D120
PC
W103
LED_PON W104
GND W153
S111
S105
S116
S112
S110
W147 V+13SW
W109 GND
D119
W148 GND
S106
REC
W144 GND
C135
(DISCNAVI)
L101
Enter
S114
ICT
FC
S107
S109
W145 V+5FL
W146 GND
(RETURN)
BAND
CN101
A CN3501
(VNP2013-A)
IC102

SIDE B

B FLKY ASSY



SIDE B



IC101

Q105

Q101 Q103

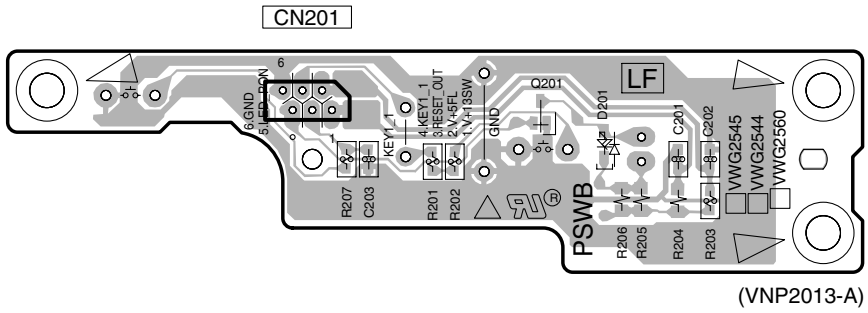
Q104 Q107 Q108
Q102 Q109

Q111

Q201

Q110

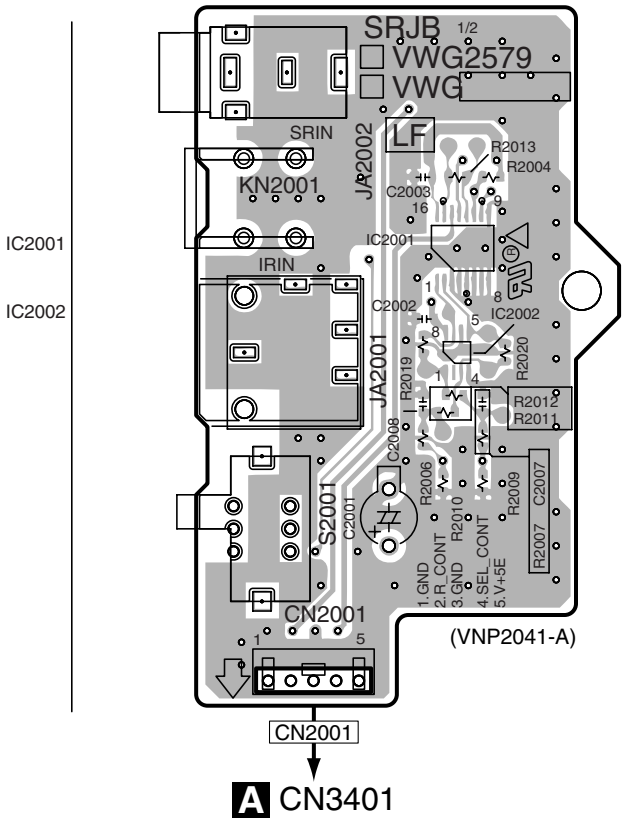
C PSWB ASSY



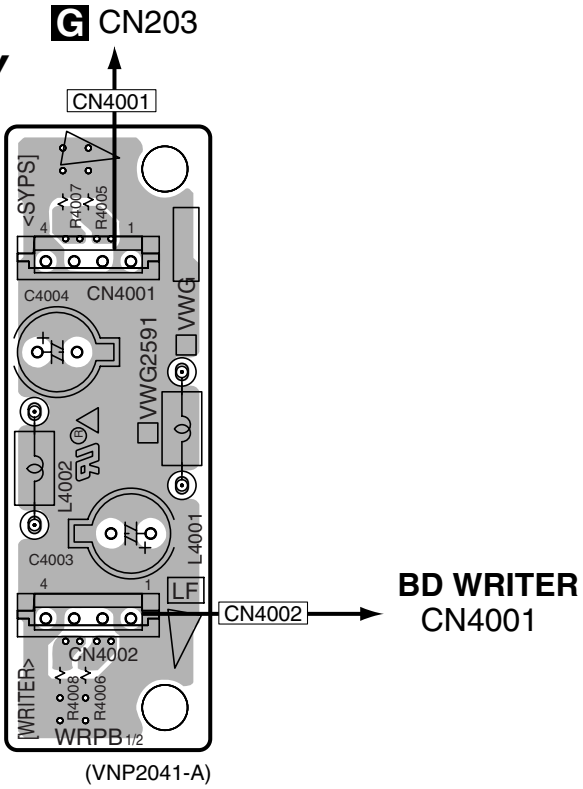
4.4 SRJB and WRPB ASSYS

SIDE A

E SRJB ASSY



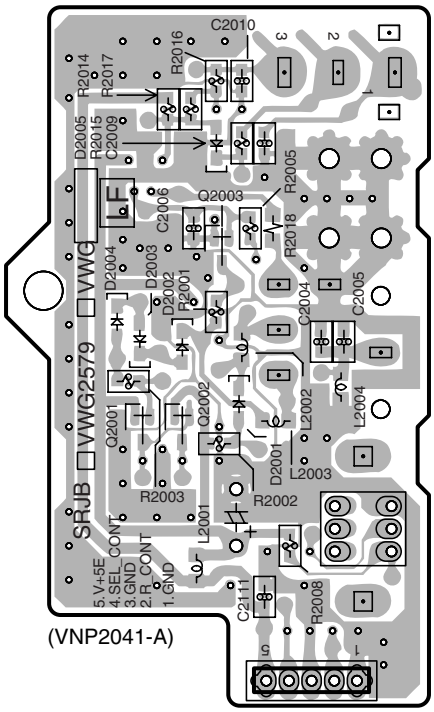
F WRPB ASSY



E F

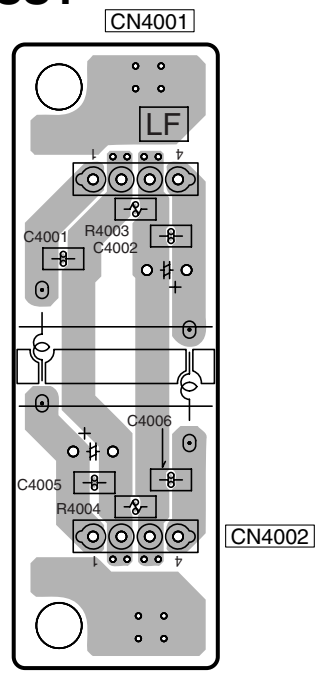
SIDE B

E SRJB ASSY



(VNP2041-A)

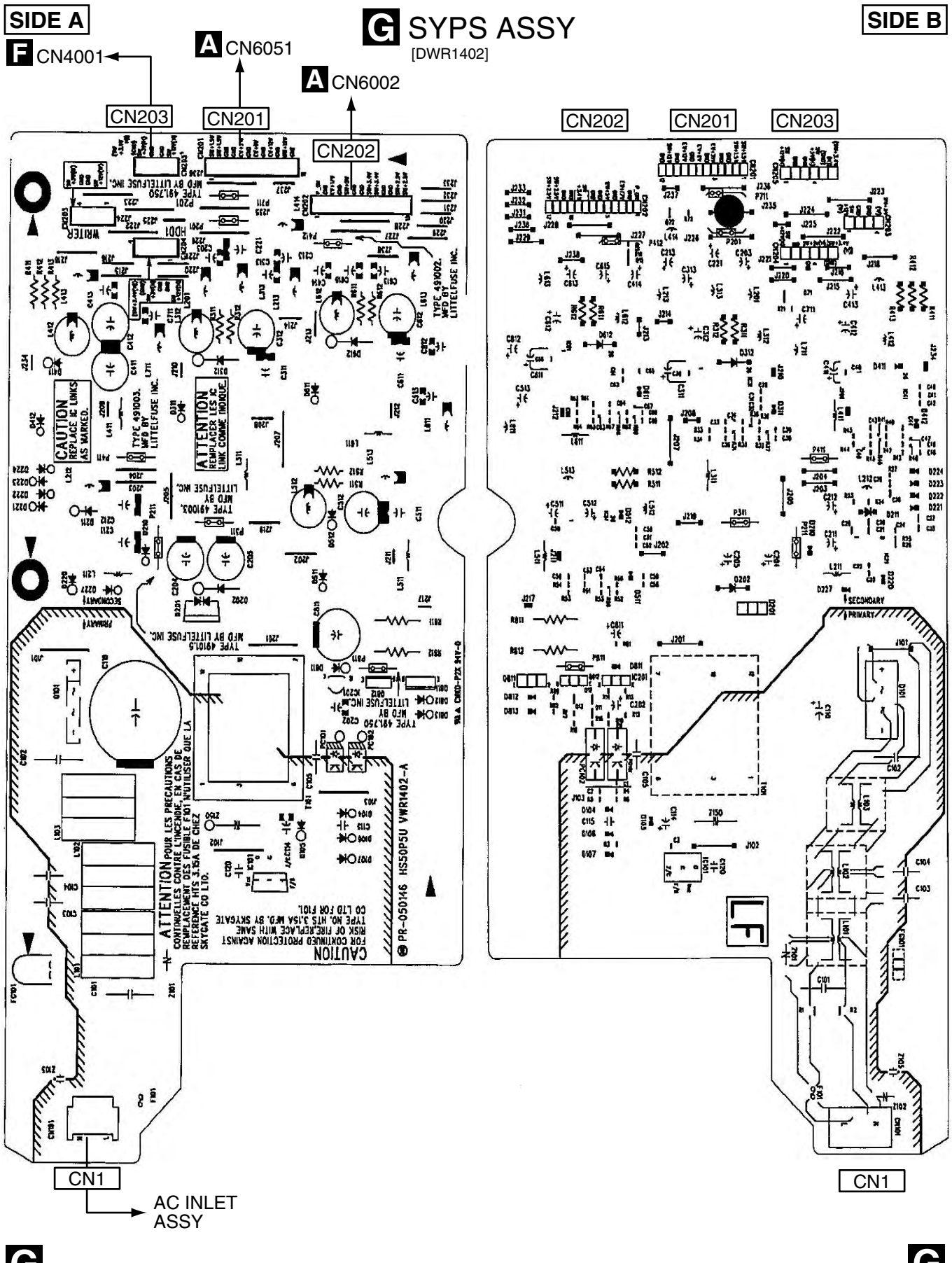
F WRPB ASSY



(VNP2041-A)

E F

4.5 SYPS ASSY


SIDE A
SIDE B
G SYPS ASSY
[DWR1402]
F CN4001
A CN6051
A CN6002
CN203
CN201
CN202
CN202
CN201
CN203
CN1
CN1
AC INLET ASSY
G
G
LF

5. PCB PARTS LIST

NOTES: ● *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
● *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
● *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω	→	*56 x 10¹*	→ *561*	*RD1/4PU 5 6 1 J*
47k Ω	→	*47 x 10³*	→ *473*	*RD1/4PU 4 7 3 J*
0.5 Ω	→	*R50*		*RN2H R 5 0 K*
1 Ω	→	*1R0*		*RS1P 1 R 0 K*

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω	→	*562 x 10¹*	→ *5621*	*RN1/4PC 5 6 2 1 F*

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
	1	..MAIN ASSY	VXX3151
NSP	1	..FLKB ASSY	VWM2357
	2	..FLKY ASSY	VWG2559
	2	..PSWB ASSY	VWG2560
NSP	1	..AUSR ASSY	VWM2394
	2	..AUJB ASSY	VWG2578
	2	..SRJB ASSY	VWG2579
	2	..WRPB ASSY	VWG2591
⚠	1	..SYPS ASSY	VWR1402

Mark	No.	Description	Part No.
A MAIN ASSY			
SEMICONDUCTORS			
	IC1001		SMP8634LF-A
	IC2001,2021,2901,2921		K4H510838C-UCCC
	IC2101,2121		K4H511638C-UCCC
	IC2701		VYW2378
	IC2801		BR24L01AFJ-W
	IC3001	LAN IC	RTL8201CP-LF
	IC3601		PE0003C
	IC3631,3711,3911,3921		TC7SH08FUS1
	IC3701		TC7WH74FU
	IC3751,5501		TC74VHCU04FT
⚠	IC3801	REGULATOR IC	S-1170B50UC-OUJ
	IC3901		BD45282G
	IC3902		BU4809F
	IC4101		LA73054
	IC4201	HD VIDEO AMP	SM5302AS
⚠	IC4401		S-1170B52UC-OUL
	IC4551	HDMI TRANSMITER	SII9030CTU-7
⚠	IC4601		NJM2880U1-05
⚠	IC4611		S-1170B18UC-OTD
	IC4701		ICS571MLF
	IC5721		TC7SZ08FU
⚠	IC6141		PQ1CZ41H2ZPH
⚠	IC6201,6211,6221,6251		S-1170B26UC-OTL
⚠	IC6301,6311,6321		S-1170B33UC-OTS
⚠	IC6501		BD3504FVM
	Q3031,3553,3554,4201		UM6K1N
	Q3721,3784,5801		DTC124EUA
	Q3781–3783,3785,5802		UMH9N
	Q4121,4131,4141,4221		2SA1576A
	Q4231,4241,4582,6102		2SA1576A
	Q4503		UM6K1N
	Q4581		HN1C03FU
	Q4591		UMD2N
	Q6101		2SC5712
	Q6103		2SC4081
	Q6121		2SD2673
	Q6131		2SA1036K
	Q6501	MOS FET	RTW060N03
	D3902		RB520S-30
	D4601		RB501V-40
	D6101		UDZS15(B)
	D6102		1SS355
	D6103		UDZS13(B)
	D6104,6105,6141		RF101L2S
	D6106		UDZS2R4(B)
MISCELLANEOUS			
	L1001,1011,1021,1031		DTL1106
	L2001,2101,2701,2901		DTL1106
	L2801,3401,3501,3601		CTF1394
	L3001,3002,3101,4501		DTL1106
	L3201–3204	COIL	VTH1056
	L3510,5731,6101,6141		VTL1175
	L3511–3513,3515–3519		CTF1306
	L3521,3523,3524,4531		CTF1306
	L3635,3701,4701,6112		CTF1357
	L4101,4201,4205,4503		CTF1394
	L4502,4504	EMI FILTER	DTL1106
	L4511–4514	COIL	ATH7022
	L4532,4534,6003		CTF1306
	L4533,5501	INDUCTOR	CTF1394
	L5502	COIL	VTL1172
	L5503	COIL	PTL1017
	L5706	INDUCTOR	CTF1384
	L6111	CHIP COIL	BTH1119
	L6113	INDUCTOR	CTF1357
	F5504	CHIP MAGNET CORE	DTF1068
	F5505	CHIP BEADS	DTF1070
	JA4101	COMB. JACK (S+1P)	AKB7159
	JA4201	3P PIN JACK	VKB1198
	JA4501	HDMI CONNECTOR	AKP1278
	JA5501	1P PIN-JACK	AKB7102

Mark No.	Description	Part No.
JA5502	OPT. LINK OUT	VKS1002
T3001	10/100BASE-T TRANS	BTX1044
T6101	TRANSFORMER	VTT1166
X1001	(27MHz) CRYSTAL	VSS1205
X3001	(25MHz) CRYSTAL	VSS1215
CN1802	40P ATA CONNECTOR	VKN2059
CN1861	7P CONNECTOR	VKN1411
CN1871	11P CONNECTOR	VKN1415
CN3001	RJ45 CONNECTOR	VKN2023
CN3401	5P PLUG	KM200TA5
CN3501	28P CONNECTOR	52044-2845
CN3601	5P CONNECTOR	VKN1374
CN5701	CONNECTOR	VKN2011
CN6002	PH 13P CONNECTOR	AKM1284
CN6051	PH 12P CONNECTOR	AKM1283

RESISTORS

R1001,1002,1031,1069	RS1/10S0R0J
R1051,1053,1059,1836	RS1/16SS0R0J
R1052,1054	RS1/16SS105J
R1056,1401–1404,1406	RAB4CQ330J
R1057,1058,1061–1064	RS1/16SS330J
R1065,1068,1074,1076	RS1/16SS103J
R1066,1067,1878,1879	RAB4CQ103J
R1070,1833,3501,3502	RS1/10S0R0J
R1071,1075,2050–2052	RS1/16SS100J
R1072,1073,1081–1084	RS1/16SS330J
R1077,1085–1087,1315	RS1/16SS103J
R1301,2045,2055,2065	RAB4CQ220J
R1302–1314,1501–1510	RS1/16SS220J
R1407,1409,1412,1419	RS1/16SS103J
R1410,1810–1813,1824	RAB4CQ330J
R1413–1416,1808,1823	RS1/16SS330J
R1421,1422	RN1/10SE1300D
R1801–1806	RAB4CQ223J
R1807,1831	RS1/16SS223J
R1814,1818,1821	RS1/16SS820J
R1815	RS1/16SS562J
R1816,1817,1820,2057	RS1/16SS220J
R1819	RS1/16SS102J
R1822,1826,1861,1862	RS1/16SS103J
R1830,1864,1865	RS1/16SS330J
R1871–1876,4701	RS1/16SS330J
R1877,1892–1894,2786	RS1/16SS103J
R1891,1895	RAB4CQ103J
R1898,1900,1901,1903	RS1/16SS0R0J
R2005,2006,2105,2106	RS1/16SS1001F
R2019,2078,2084–2086	RS1/16SS0R0J
R2041,2048,2061,2068	RAB4CQ100J
R2058,2075,2076,2140	RS1/16SS220J
R2070–2072,2143,2144	RS1/16SS100J
R2073,2145,2146,2155	RAB4CQ220J
R2081–2083,2087	RAB4CQ0R0J
R2088,2089,2119	RS1/16SS0R0J
R2141,2142,2148,2149	RAB4CQ100J
R2147,2157,2158,2160	RS1/16SS220J
R2150–2152,2163,2164	RS1/16SS100J
R2156,2165,2166,2173	RAB4CQ220J
R2161,2162,2168,2169	RAB4CQ100J
R2167,2175,2176,2957	RS1/16SS220J

Mark No.	Description	Part No.
R2170–2172,2178	RS1/16SS100J
R2174,2945,2955,2965	RAB4CQ220J
R2181–2183,2187,2941	RAB4CQ100J
R2184–2186,2188,2189	RS1/16SS100J
R2381–2383,2393,2481	RS1/16SS0R0J
R2483,2491,2493,2703	RS1/16SS0R0J
R2706,2715–2717,2781	RS1/16SS0R0J
R2791,2799,4551,4552	RS1/16SS0R0J
R2794,3033,3034	RS1/16SS103J
R2905,2906	RS1/16SS1001F
R2948,2961,2968	RAB4CQ100J
R2950–2952,2970–2972	RS1/16SS100J
R2958,2975,2976,4564	RS1/16SS220J
R2973,3011	RAB4CQ220J
R3012,3013	RS1/16S1001F
R3021–3024	RS1/16S49R9F
R3201–3204,4121,4122	RS1/16S75R0F
R3503	RAB4CQ102J
R3781–3786,3788	RS1/16SS332J
R4111–4113,4211–4213	RS1/10S75R0F
R4114–4116,4214–4216	RS1/10S0R0J
R4131,4132,4141,4142	RS1/16S75R0F
R4221,4222,4231,4232	RS1/16S75R0F
R4241,4242	RS1/16S75R0F
R4553–4556,4559	RAB4CQ0R0J
R4557,4558,4560,4565	RS1/16SS0R0J
R4561,4562	RS1/16SS4700F
R4705	RN1/16SSE1000D
R4708	RS1/16SS470J
R5101,5103,5105,5107	RS1/16SS0R0J
R5109,5111,5113,5115	RS1/16SS0R0J
R5506	RS1/10S75R0F
R6001,6002,6123,6133	RS1/10S0R0J
R6107	RS1/10S221J
R6151–6155	RS1/4SA472J
R6505	RS1/16S3301F
R6506	RS1/16S3901F

RESISTORS

Other Resistors	RS1/16S###J

CAPACITORS

C1001,1004,1011,1021	CEVLW221M4
C1002,1012,1022,1032	CKSRYF105Z10
C1003,1013,1023,1033	CCSRCH102J50
C1005–1007,1014,1024	CKSQYB106K6R3
C1008,1037 (150 uF/ 4 V)	VCH1266
C1031,1034,2016,2036	CEVLW221M4
C1035,1036,2702,2801	CKSQYB106K6R3
C1051	CCSSCH120J50
C1052	CCSSCH100D50
C1101–1112,1151,1153	VCG1063
C1113–1128,1201,1203	CKSSYF104Z16
C1129–1141,1152,1154	CKSRYF105Z10
C1161,1428,1801,1802	CKSRYF105Z10
C1162,1202,1205,1425	VCG1063
C1204,1206,1421,1422	CKSSYF104Z16
C1423,1424	CKSSYB822K16
C1426,1427,2003	CKSSYF104Z16
C1821	CCSRCH470J50
C1861,1871,2001,2002	CKSRYF105Z10
C2004,2008,2021,2023	CKSRYF105Z10

Mark No.	Description	Part No.
C2005,2006,2024,2025		CKSSYB103K16
C2007,2009,2010,2026		VCG1063
C2011–2014,2022,2030		CKSSYF104Z16
C2015,2115,2915,6304		VCH1234
C2027,2101,2102,2104		CKSRYF105Z10
C2028,2029,2107,2109		VCG1063
C2035,2116,2706,2935		CEVW221M4
C2103,2111–2114,2122		CKSSYF104Z16
C2105,2106,2124,2125		CKSSYB103K16
C2108,2121,2123,2127		CKSRYF105Z10
C2110,2126,2128,2129		VCG1063
C2130,2701,2802,2903		CKSSYF104Z16
C2135,2136,2916,2936		CEVLW221M4
C2703,2704,2901,2902		CKSRYF105Z10
C2705,3911,3922		CKSRYB102K50
C2904,2908,2921,2923		CKSRYF105Z10
C2905,2906,2924,2925		CKSSYB103K16
C2907,2909,2910,2926		VCG1063
C2911–2914,2922,2930		CKSSYF104Z16
C2927,3007,3631,3701		CKSRYF105Z10
C2928,2929,4705		VCG1063
C3001,3004,4501,4503		CEVLW221M4
C3002,3003,3005,3006		CCSRCH102J50
C3021,3022,3111,3113		CKSRYF104Z50
C3041		CCSRCH200J50
C3042		CCSRCH150J50
C3044,3507,4502		CCSRCH102J50
C3112		CEVLW330M25
C3201	CERAMIC CAPACITOR	ACG1127
C3202,3203,3501–3505		CKSRYF104Z50
C3401,3802,4151–4153		CKSQYB106K6R3
C3402,3611,3632,3903		CCSRCH101J50
C3601,3803,4101,4201		CEVW101M16
C3602,3608,4102		CKSRYF104Z50
C3614,3615,6703–6705		CCSRCH220J50
C3702,3751,3901,3912		CKSRYF105Z10
C3761,5701–5704		CKSRYB104K50
C3801,4402,4602,4604		CKSQYB225K10
C3905,3903		CCSRCH101J50
C3921,4121,4131,4141		CKSRYF105Z10
C4104–4106,4108–4110		CKSRYF104Z50
C4107,4611,6141		CEVLW470M16
C4111,4112,4211–4213		CEAT102M6R3
C4113,4203–4206,4209		CKSRYF104Z50
C4202,4207,4208		CKSQYB106K6R3
C4210,4511–4521,5529		CKSRYF104Z50
C4221,4231,4241,4704		CKSRYF105Z10
C4251–4253,4404,4405		CKSQYB106K6R3
C4401,4605,5731,6124		CEVW101M16
C4504–4506,4508,4510		CCSRCH102J50
C4507,6214,6224,6254		CEVLW221M4
C4509,4613,5505,5530		CKSQYB106K6R3
C4522,4523,5503,5504		CCSRCH102J50
C4612,6144,6202,6212		CKSQYB225K10
C4703		CKSSYF104Z16
C5501,6204		CEVW221M4
C5502,5525,5528,5721		CKSRYF105Z10
C5521	(47 uF/ 16 V)	VCH1241
C6001–6003,6053,6055		CKSRYF105Z10
C6004,6051,6052,6054		CKSRYF104Z50
C6005,6011–6016,6105		CKSRYB103K50
C6101,6103,6106,6108		CKSRYF104Z50
C6102	(68 uF/16 V)	VCH1267
C6104,6503,6504		CKSRYB223K50
C6107,6110,6143		CEHAZA101M35
C6109		CEVW100M50
C6122,6123,6125,6132		CKSRYF104Z50
C6126,6134,6136,6201		CEVW101M16
C6133,6135,6142		CKSRYF104Z50
C6203,6213,6223,6253		CKSQYB106K6R3
C6205		VCH1258
C6222,6252,6302,6312		CKSQYB225K10
C6301		CEVW101M16
C6303,6313,6323,6502		CKSQYB106K6R3
C6314,6324,6501	(150 uF/4 V)	VCH1234
C6322		CKSQYB225K10
C6505		CKSQYB106K6R3

D AUJB ASSY

SEMICONDUCTORS

⚠ IC3051		NJM78M05FA
IC3301,3401,3501		PCM1738EG-3
IC3311,3321,3331		OPA2134PAS1
IC3402,3502		TC7SH08FUS1
IC3411,3421,3431,3511		NJM5532MD
IC3521,3531		NJM5532MD
Q3351,3352,3361,3362		2SD2114K
Q3371,3373,3381,3383		2SK2034
Q3372,3382,3472,3572		2SA1576A
Q3451,3461,3551,3561		2SD2114K
Q3471,3473,3571,3573		2SK2034
D3001		RB501V-40
D3101,3102		1SS355

COILS AND FILTERS

F3301,3302,3401,3402		DTF1070
F3501,3502,3651		DTF1070

CAPACITORS

C3001,3002,3004,3005		CKSRYF104Z25
C3006,3053,3301		CEHAZA471M6R3
C3051,3102,3103		CEHAZA221M16
C3052,3307,3310,3312		CKSRYF104Z25
C3101		CEHAZA102M6R3
C3105,3303,3403,3405		VCH1249
C3110,3119,3340,3440		CCSRCH102J50
C3302,3341,3402,3441		CKSRYF105Z10
C3305,3306		VCH1261
C3308,3309,3327,3408		CCSRCH331J50
C3311,3315,3321,3325		VCH1257
C3313,3314,3323,3324		VCE1051
C3316,3322,3326,3400		CKSRYF104Z25
C3331,3338		VCH1257
C3333,3343		VCE1052
C3334,3335,3344,3345		VCE1051
C3337,3347		VCH1255

Mark No.	Description	Part No.
	C3351,3451,3551	CCH1510
	C3401,3501	VCH1248
A	C3406,3503,3505,3506	VCH1249
	C3407,3410,3412,3416	CKSRYF104Z25
	C3409,3427,3508,3509	CCSRCH331J50
	C3411,3415,3421,3425	VCH1247
	C3413,3414,3423,3424	CCSRCH471J50
	C3422,3426,3500,3507	CKSRYF104Z25
	C3431,3438,3511,3515	VCH1247
	C3433,3443,3533,3543	CCSRCH122J50
	C3434,3435,3444,3445	CCSRCH471J50
	C3437,3447,3537,3547	CEANP470M16
	C3502,3541	CKSRYF105Z10
B	C3510,3512,3516,3522	CKSRYF104Z25
	C3513,3514,3523,3524	CCSRCH471J50
	C3521,3525,3531,3538	VCH1247
	C3526	CKSRYF104Z25
	C3527	CCSRCH331J50
	C3534,3535,3544,3545	CCSRCH471J50
	C3540	CCSRCH102J50
	RESISTORS	
	R3001–3008,3051,3052	RS1/10S0R0J
C	R3108,3109,3318,3418	RS1/10S0R0J
	R3304	VCN1141
	R3313,3314,3323,3324	VCN1140
	R3331–3333,3336	VCN1138
	R3334,3335,3344,3345	VCN1139
	R3337,3347	VCN1136
	R3341–3343,3346	VCN1138
	R3351,3354,3361,3364	VCN1137
	R3401,3501	RN1/16SE1602D
	R3413,3414,3423,3424	RN1/16SE6200D
	R3431–3433,3436	RN1/16SE1201D
D	R3434,3435,3444,3445	RN1/16SE1801D
	R3441–3443,3446	RN1/16SE1201D
	R3513,3514,3523,3524	RN1/16SE6200D
	R3518	RS1/10S0R0J
	R3531–3533,3536	RN1/16SE1201D
	R3534,3535,3544,3545	RN1/16SE1801D
	R3541–3543,3546	RN1/16SE1201D
	Other Resistors	RS1/16S###J
	OTHERS	
	JA3301 2P PIN JACK	AKB7104
E	JA3401 6P PIN JACK AU	VKB1235
	KN3101–3103 TERMINAL	VNF1084
	CN3001 B TO B CONNECOR	VKN2008

E SRJB ASSY

SEMICONDUCTORS

	IC2001	TC74HC4053AFT
	IC2002	TC7WH34FU
F	Q2001,2002	DTA124EUA
	Q2003	DTC124EUA
	D2001–2004	1SS355
	D2005	RB501V-40

Mark No.	Description	Part No.
	COILS AND FILTERS	
	L2002–2005	CTF1394
	F2001	DTF1070
	SWITCHES AND RELAYS	
	S2001	VSH1009
	CAPACITORS	
	C2001	CEAT101M16
	C2002,2003,2005,2009	CKSRYF104Z25
	C2004,2006	CCSRCH471J50
	C2007,2008	CKSRYB153K25
	C2010	CCSRCH681J25
	C2111	CKSRYF104Z25
	RESISTORS	
	All Resistors	RS1/16S###J
	OTHERS	
	JA2001 H.P JACK	RKN1006
	JA2002 REMOTO JACK	RKN1004
	KN2001 TERMINAL	VNE1948
	CN2001 5P SOCKET	KP200TA5L

F WRPB ASSY

COILS AND FILTERS

	L4001,4002	VTH1013
	CAPACITORS	
	C4001,4002,4005,4006	CKSRYB105K16
	C4003	CEAT100M50
	C4004	CEHAZA221M16
	OTHERS	
	CN4001,4002 4P TOP POST	B4B-EH

C PSWB ASSY

SEMICONDUCTORS

	Q201	DTC124EUA
	D202 LED(BLUE)	SLR-343BBT(GHJK)
	MISCELLANEOUS	
	CN201 6P FFC CONNECTOR	VKN1237
	S202 TAKT SWITCH	VSG1024
	RESISTORS	
	All Resistors	RS1/16S###J
	CAPACITORS	
	C201, 202	CKSRYF104Z25

B FLKY ASSY

SEMICONDUCTORS

	IC101 FL	PT6315
	Q101–103,105, 107	DTC124EUA
	D113, 115	SLR-343BBT (GHJK)
	D111, 112, 116, 118	SLR-343VC (NPQ)

Mark No.	Description	Part No.

MISCELLANEOUS

S101–118	TAKT SWITCH	VSG1024
CN101	28P FFC CONNECTOR	52492-2820
CN102	6P FFC CONNECTOR	VKN1237
V101	FL TUBE	VAW1084
IC102	REMOTE RECEIVERE UNIT	RPM7140
100	FL HOLDER	VNF1130

RESISTORS

All Resistors	RS1/16S###J

CAPACITORS

C136	CEJQ101M16
C135	CEJQ101M6R3
C105, 112, 127- 129	CKSRYB103K50
C122	CKSRYB105K16
C104, 107, 113, 120, 121, 124	CKSRYF104Z25
C130, 131, 132	CKSRYF104Z25
C109, 123	CKSRYF105Z10

G SYPS ASSY [VWR1402]

SYPS assembly has no service part.

6. ADJUSTMENT

6.1 NECESSARY ADJUSTMENT POINTS

When	Adjustment Points
■ Exchange Parts of Mechanism Assy	
Exchange the DRIVE ASSY	**Mechanical point**: • None **Electric point**: • ID NUMBER and DATA SETTING • FIRMWARE UPDATE
■ Exchange PCB Assy	
Exchange MAIN ASSY	**Mechanical point**: • None **Electric point**: • ID NUMBER and DATA SETTING • FIRMWARE UPDATE

6.2 ID NUMBER AND DATA SETTING

[Purposes]

- An individual ID number and ID data (AACS, CPRM, BD+, Windows Media DRM, and MAC address) must be input at the same time. All data are determined according to the data on the ID data disc. If the number and data are not set correctly with the following procedure, the unit does not work properly. You will find the ID number to be labeled on the rear panel.

This setting is Necessary When:

- When the DRIVE Assy or MAIN Assy is replaced.

[Tools to be used]

Remote control unit for servicing
(GGF1381)

ID Disc for Blu-ray Player
(GGV1306)

[Notes]

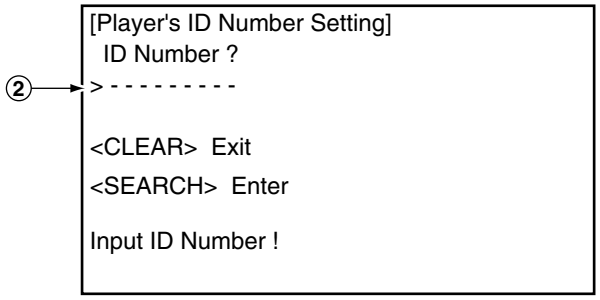
Important: If no ID label is found on the rear panel, write down the specified ID number by checking it on the version check screen ([ESC] + [DISP]).

- Input the ID number while the unit is in Stop mode.
- After the data are read from the ID data disc, the disc will automatically be unloaded.
- Each time a key input succeeds, the screen background becomes blue. If a key input fails, the screen background becomes red.

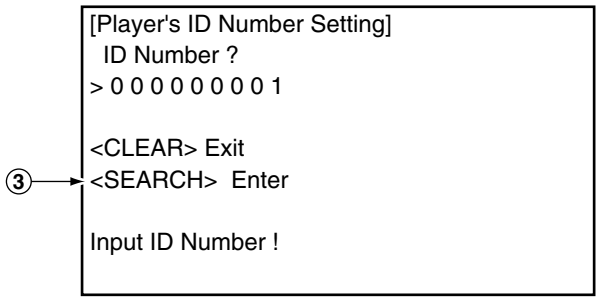
How to Input the ID Number and ID Data

① To enter the input mode, press ESC + STEREO keys sequentially in a status with no ID number set, such as after FLASH-ROM downloading.

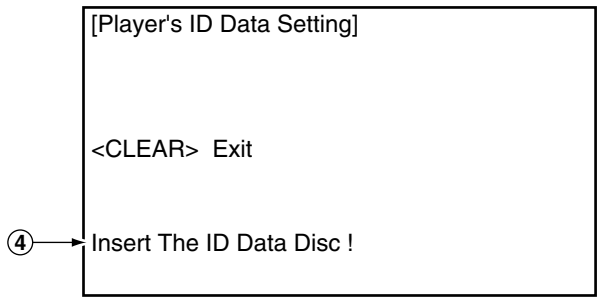
② As number input is enabled when the unit enters the input mode, input the 9-digit ID number.
(The entered number is also displayed on the FL display.)



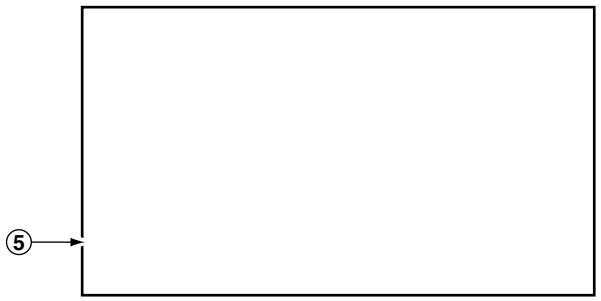
③ After inputting the number, press SEARCH keys to register the ID number. (SEARCH key is not accepted until 9 digits are entered.)



④ When the ID number has been registered, the unit enters the ID data input mode.
In this condition, place the ID data disc on the tray and close the tray using the CLOSE key "■/⏏" on the player.

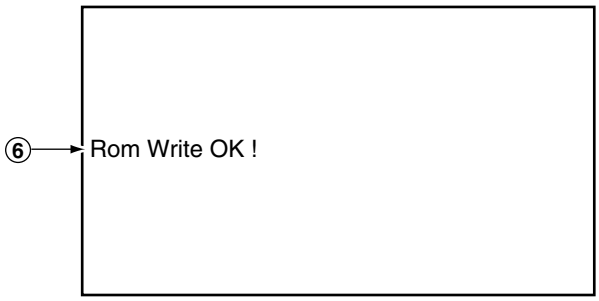


⑤ While the data are being read, no indication is displayed (black screen) .



⑥ When the ID data have been written to the FLASH-ROM, the message "Rom Write OK" is displayed on the screen.
(The FL display indicates "ID OK.")

⑦ After confirming this message, press CLEAR key to exit the input mode.



[Example of indications on the FL display when a numeric ID number is input]

Order of numeric inputs: 0, 1, then 2

0 1 2 · · · · · · ·

Note: An ID number is not displayed during the process of clearing the ID number, regardless of whether an ID number has already been registered or not.
If an ID number is already registered, the new ID number will be written over the previous one.

6.3 FIRMWARE UPDATE

UPDATE PROCEDURE

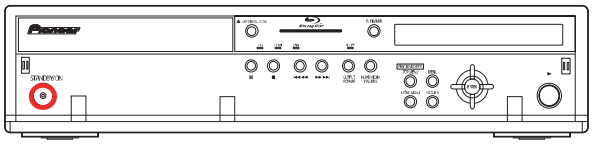
1) APPLICATION UPDATE

1. Plug a power cable into the unit.
2. Press the "STANDBY/ON" button to switch the unit on.
3. Press the "OPEN/CLOSE" button to open the disctray.
4. Place an application UPDATE disc on the tray.
5. Press the "OPEN/CLOSE" button on the front panel to begin the application update.

   * FL display indicates "DL OK" and the unitauto matically switches into standby with the tray opening.

   * The update time takes 5 to 25 minutes, it changes depending on the version.

DO NOT unplug the power cable or press the standby button until the unit switches into standby mode.

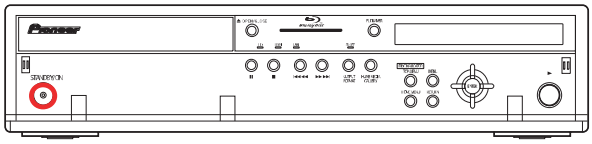


6. Remove the application UPDATE disc from the tray.
7. Press the "STANDBY/ON" button to switch the unit on, and check if FL display indicates "DL OK". The updato is completed if FL display indicatates "DL OK".

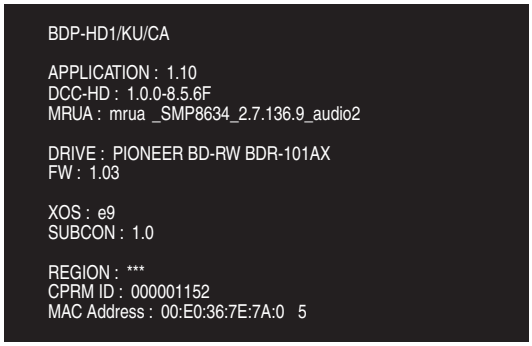
UPDATE PROCEDURE

2) VERSION CHECK

1. Press the "STANDBY/ON" button on the front panel to switch the unit on.



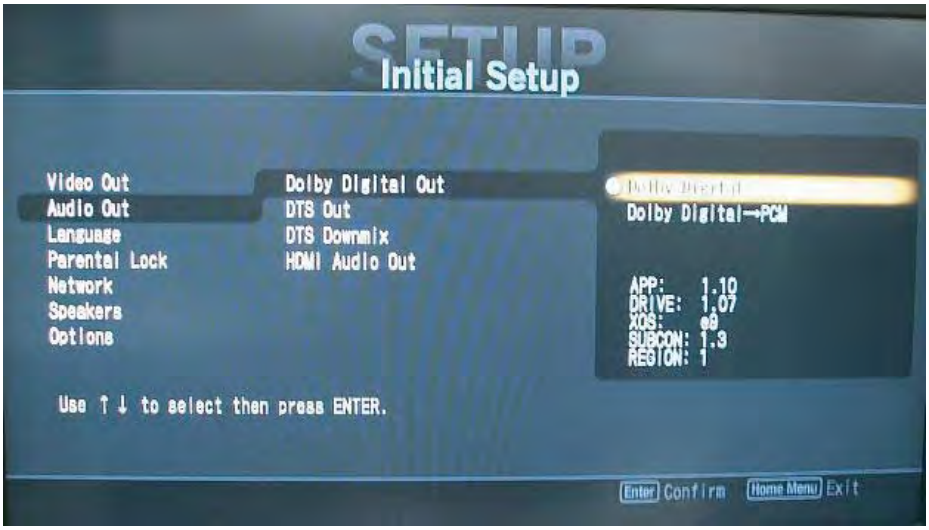
2. Press the "ESC" button and press the "DISP" button on the service remote to display the application version.



3. Check if the Application is properly updated to the latest version.
4. Press the "ESC" on the service remote to hide the version check screen.

Check with accessory remote controller

1. Press the "Home Menu" button
2. Select "Initial Setup" and press "Enter"
3. Select "Audio Out" - "Dolby Digital Out - "Dolby Digital"(3rd layer)
4. Press the "Angle" button



A

B

C

D

E

F

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 SERVICE KEY INPUT

How to enter each check mode

- Each check mode described in this specification can be entered even during Normal Operation mode or for CA check, by using the remote control unit for servicing.
- Key names enclosed in quotation marks (" ") are those on the remote control unit for servicing.

No.	Command Name	Key Input	Operation/Usage	Remarks
1	Settings at shipment	Press "ESC" then "CLEAR."	For restoring the settings at shipment (The unit will not be turned off.)	• Special condition for entering the mode: The unit must not be in Playback mode. • This check mode for settings at shipment (the unit will be turned off) is the same as that entered by simultaneously pressing the STOP and POWER keys on the main unit.
2	Error-Rate Measurement mode 1 (with judgment)	Press "ESC" then "SIDE B."	After automatic error-rate measuring, the results are displayed.	For details, refer to "7.1.3 How to measure the error rate."
3	Search mode	Press "ESC" then "+10."	Switching the numeric-key search from Chapter Search to Title Search during playback of BD-ROM or DVD-Video discs.	
4	Checking of the keys on the main unit	Press "ESC" then "SIDE A."	When a key on the main unit or the remote control unit is pressed, the corresponding key code is displayed on the FL display. If check results of pressing all the keys on the main unit (the order of keypresses can be random) are "OK," all the segments on the FL display light.	Keypresses can be in no particular order. After all the keys on the main unit are pressed, all the segments on the FL display light. Until that, the corresponding key code is displayed when any key is pressed.
5	Switching of the settings for OUTPUT FORMAT	Press "ESC" then "8."	The same operation as that when setting the Component output to 480i.	The initial setting is Auto.
		Press "ESC" then "TV/LDP."	The same operation as that when setting the Component output to 480p.	
		Press "ESC" then "1."	The same operation as that when setting the Component output to 1080i.	
		Press "ESC" then "CX."	The same operation as that when setting the Component output to 1080p.	
6	Indications for Servicing	Press "ESC" then "DISP."	For details on operations after key inputs, see the sheet "7.1.2 Screen indication for Servicing."	
7	CPRM ID Registration mode	Press "ESC" then "STEREO."	Enter the specific ID number for the recorder, press the CPRM and HDCP (and DTCP) keys, then enter the MAC address.	For details, see "6.2 CPRM ID number and Data setting."
8	Model Identification mode	Press "ESC" then "DIG/ANA."	For confirmation of the destination and version number of the model.	For production use.
9	On-Screen Display output	Press "ESC," "SEARCH," then "6," in that order.	For setting the On-Screen Display output to ON.	Use to stop the On-Screen Display output.
		Press "ESC," "SEARCH," then "7," in that order.	For setting the On-Screen Display output to OFF.	
10	Audio muting at the last stage of output	Press "ESC" then "9."	For forcibly muting the audio output.	
		Press "ESC" then "0."	For forcibly canceling audio muting	
11	Switching of the LED display	Press "ESC" then "REPEAT A."	All the segments on the LED display are lit.	
		Press "ESC" then "REPEAT B."	All the segments on the LED display go dark.	
12	Switching of the AUDIO MULTI output	Press "ESC" then "CHAP."	For setting the AUDIO MULTI output to All Channel Output mode	
13	Error-Rate Measurement mode 2 (for continuous playback)	Press "ESC," "DISP," then "2," in that order.	After automatic error-rate measuring, the result is displayed as an OSD.	• Special condition for entering the mode: The unit must be in Playback mode. • For details, see "7.1.3 How to measure the error rate."
14	4:3 Video out switch	Press "ESC", then "FRM/TIM".	Switch TV ASPECT ratio in Video out to 4 : 3 (Standard).	The intitial setting is 16 : 9 (Widoscreen).

Specifications of the ESC code

- When the "ESC" key is pressed, ESCAPE mode is entered, and the next keypress will have a special meaning.
- If any key other than the ones indicated in the above table is the first one pressed after the "ESC" key, ESCAPE mode is canceled.
- "ESC" key repeat is ignored, and ESCAPE mode is maintained.

Codes to be used in Service mode

Codes for the remote control unit for servicing

No.	Function	Code
1	ESC	A85F
2	0	A800
3	1	A801
4	2	A802
5	3	A803
6	4	A804
7	5	A805
8	6	A806
9	7	A807
10	8	A808
11	9	A809
12	+10	A81F
13	CLEAR	A845
14	POWER	A81C
15	SIDE A	A84D
16	SIDE B	A84E
17	STEREO	A84A
19	SEARCH	A842
20	DIG/ANA	A80C
21	TEST	A85E
22	DISP	A843
23	CX	A80E
24	REPEAT A	A848
25	REPEAT B	A844
26	CHAP	A840
27	PLAY	A817
28	TV/LDP	A80F
29	FRM / TIM	A841

How to restore the settings at shipment

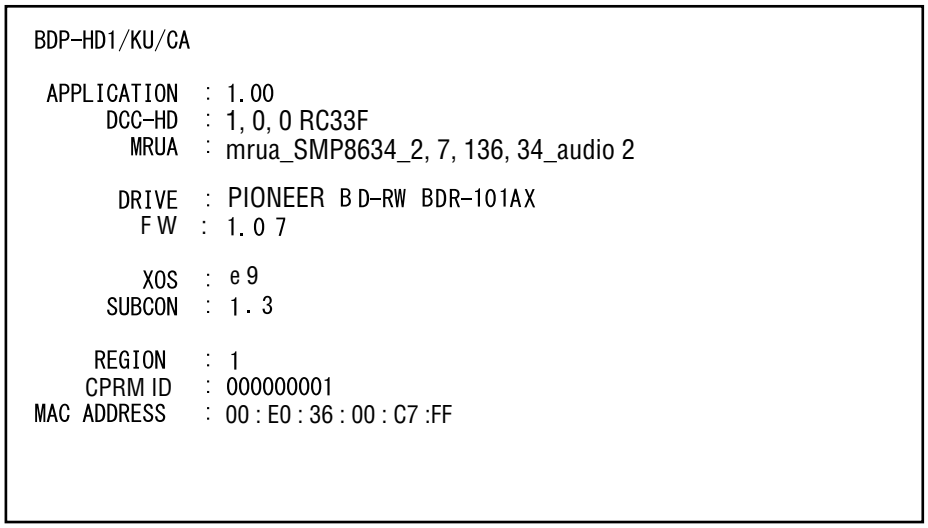
Make sure that the player's ON

Simultaneously press the STOP and Standby/ON keys on the main unit. The settings at shipment are restored, then the power is turned off.

7.1.2 SCREEN INDICATION FOR SERVICING

1. Specifications of the Version Information screen

● **First screen (Version information, etc.)**



① **Data on the model:** Model name/destination

② **Data on the application program:** Version for PRA application
Note: In the application program, data on DCC-HD, MRUA, built-in drive, SUBCON (PIC,) and XOS are included.

③ **Data on DCC-HD:** Version of middleware for Sigma

④ **Data on MRUA:** Version of the driver for Sigma

⑤ **Data on the built-in drive:**
Drive name

Version

⑥ **Data on XOS:** Version of firmware for Sigma Chip 8634

⑦ **Data on SUBCON (PIC):**
Version of firmware for the submicrocomputer (PIC)

⑧ **Data on regions:**
Region numbers for the DVD-ROM .
If the region number has not been set, "VIRGIN ROM" is indicated.

⑨ **Data on CPRM:** CPRM key number
If it has not been set, "??????????" is indicated.

⑩ **MAC address:** Value of the MAC address
If it has not been set, "????????????" is indicated.

7.1.3 HOW TO MEASURE THE ERROR RATE

■ Specifications of error-rate measurement 2 (for continuous playback)

How to start

During playback, press the "ESC", "DISP", then "2" keys, in that order, to measure the error rate continuously and to display the results as an OSD. Those keys are accepted in either Normal Startup mode or Service mode.

Note: For details on key input, see "3. Overview of Screen Change" on the "7.1.2 Screen Indication for Servicing".

Error Rate Measuring

The error rate during playback is measured, and playback time, title and chapter, the address that was read, and the result of measured error rate are displayed as an OSD.

How to measure an error rate

1. Press the "ESC", "DISP", then "2" keys, in that order, to start measuring the error rate.
2. To cancel and exit Error-Rate Measuring mode, press the "ESC" key while the error rate is being measured.

• While error-rate measuring is stopped, an OSD will remain displayed.

OSD display format

(1)	(2)
TM:**h**m**s	TT:***-***
(3)	**(4)**
LgcSct	ErrRate
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*
********	*.**E-*

(1) Title and chapter data:
Title and chapter numbers for the program being played back

(2) Playback time data:
Elapsed time of the program being played back

(3) LgcSct address data:
Logical sector address where a measurement of error rate starts (Bytes 3 to 6 [information] of the Request Sense Standard Data)

(4) Error-rate data:
Value of a measured error rate

LgcSct address and error rate data will be displayed continuously during playback.

Criterion

Disc Type	Reference Value (less than)
DVD-Video	1.0×10^{-3}
DVD-R	1.0×10^{-3}
DVD-RW	1.0×10^{-3}
BD-ROM	1.0×10^{-3}
BD-R	1.0×10^{-3}
BD-RE	1.0×10^{-3}

7.1.4 TROUBLE SHOOTING

■ Power On Sequence

① Pressing of the POWER key is detected by the IC3601 Submicrocomputer on the MAIN Assy. The IC3601 then outputs a POWER_ON signal to the SYPS Assy.

↓

② After receiving the POWER_ON signal, the SYPS Assy activates, secondary Power, setting it to ON.

↓

③ The SMP8634 (IC1001), the core LSI, starts up.

↓

④ Communication between the SMP8634 and the DDR SDRAM starts.

↓

⑤ Communication between the SMP8634 and the FLASH_IC starts.

↓

It takes about 1 minute to complete the startup process.

■ Troubleshooting

① Are the pins at CN6051 and CN6002 supplied with voltages?

↓

② Is the reset signal H? (R1088)

↓

③ Is the 27-MHz CLK oscillating? (X1001)

A

B

C

D

E

F

7.2 DISASSEMBLY

Note 1: Do NOT look directly into the pickup lens. The laser beam may cause eye injury.
Note 2: Even if the unit shown in the photos and illustrations in this manual may differ from your product, the procedures described here are common.
Note 3: For the performing the diagnosis shown below, the following jigs for service are required.
- GGF1529 : Emerqency tray ejection rod.
- GGF1533 : BB Extension board
- GGD1437 : BB Extension cable

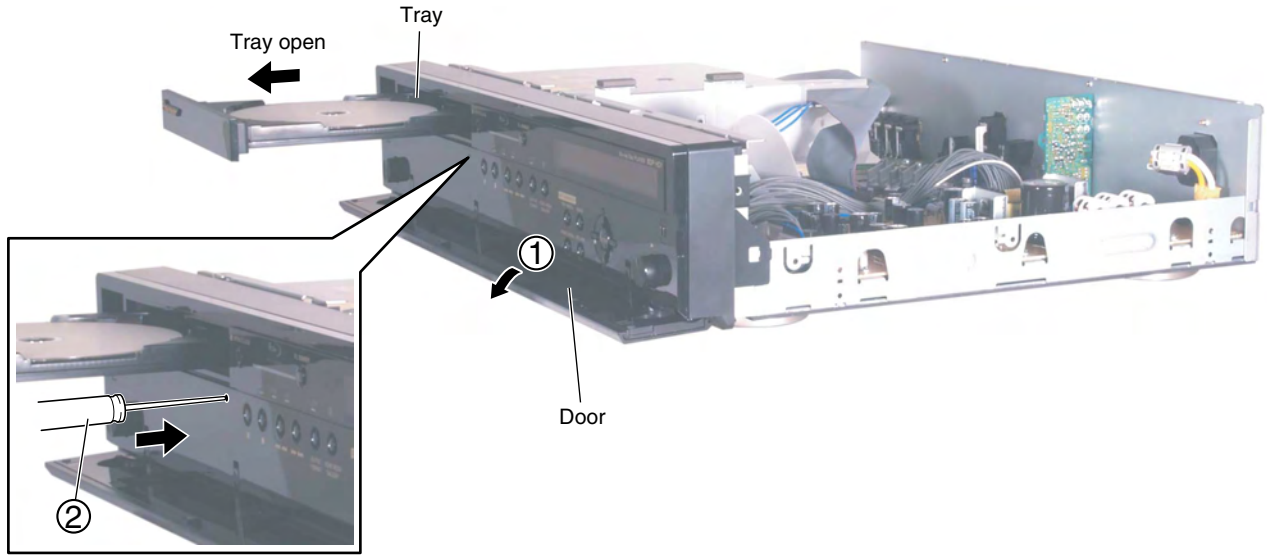
Diagnosis of PCB's

1 Bonnet Case and Tray Panel

① Remove the Bonnet Case by removing the eight screws.
② Press the ⏻ STANDBY/ON button to turn on the power.
③ Press the ⏏ OPEN/CLOSE button to open the Tray.
④ Remove the Tray Panel.
⑤ Press the ⏻ STANDBY/ON button to turn off the power.
⑥ Pull out the Power cord.

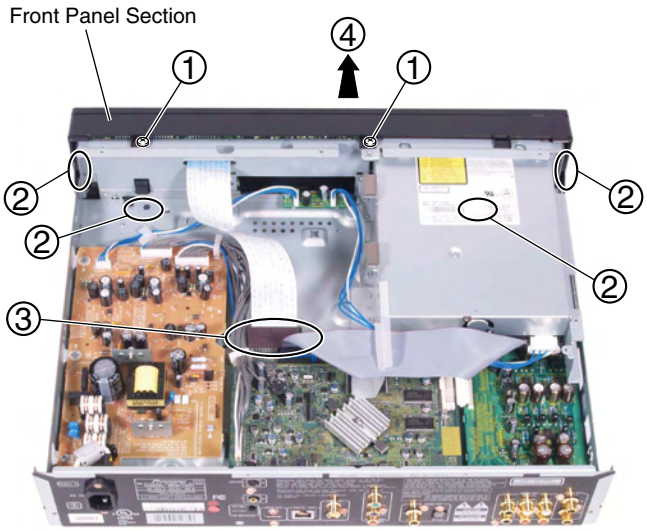
● **How to open the Tray when the power cannot be on**

① Open the Door.
② Insert GGF1529 into bore as shown in the following figure.
If the Tray pops out a little, fully pull it out by hand.

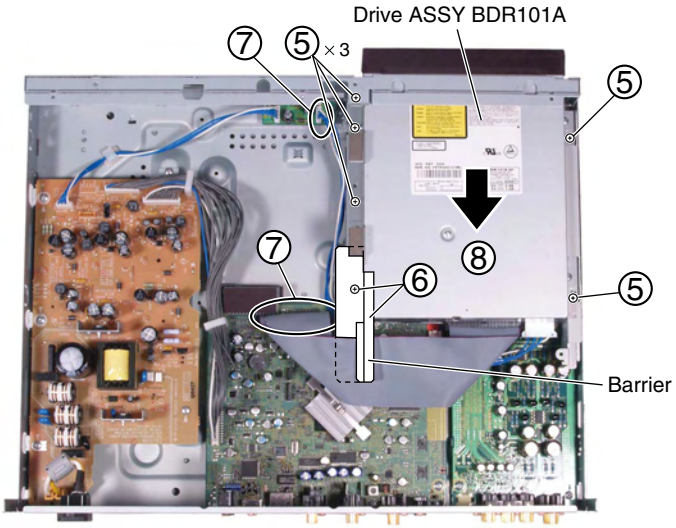


2 Front Panel Section and Drive ASSY BDR101A

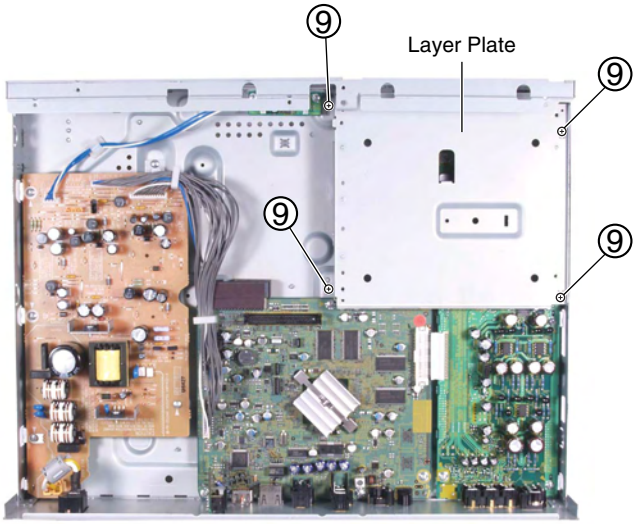
① Remove the two screws.
② Unlock the four hooks.
③ Disconnect the connector.
④ Remove the Front Panel Section.



⑤ Remove the five screws.
⑥ Remove the screw and then remove the styling sheet.
⑦ Disconnect the two connectors.
⑧ Remove the Drive ASSY BDR101A.



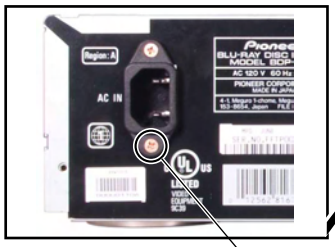
⑨ Remove the four screws.
⑩ Remove the Layer Plate.



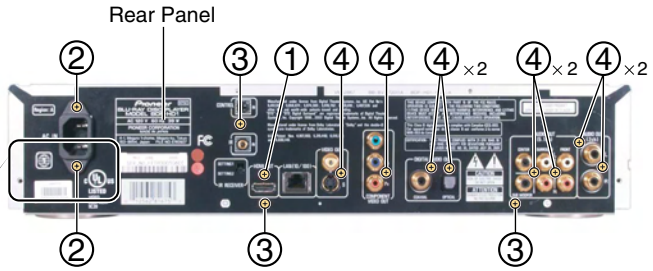
3 Rear Panel

① Remove the screw. (PCZ30P060FCC)
② Remove the two screws. (CBZ30P080FCC)
③ Remove the three screws. (BBZ30P060FCC)
④ Remove the eight screws. (BPZ30P080FCC)
⑤ Remove the Rear Panel.

*Notes of assembly

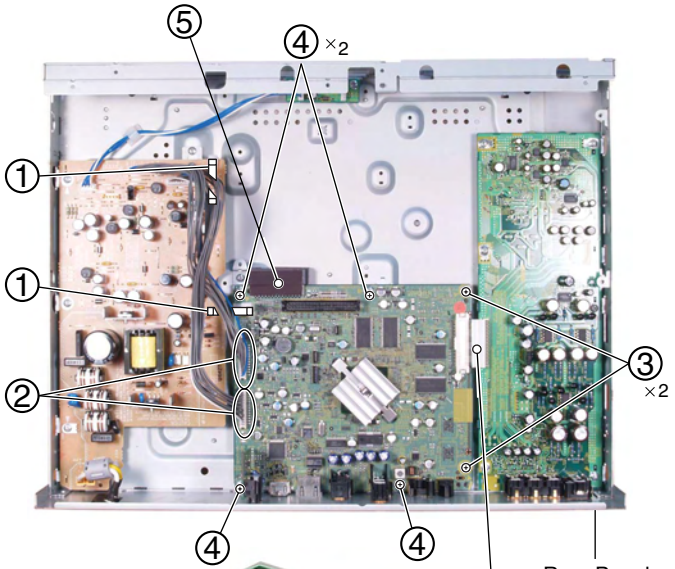


Note: Do not use an electric screwdriver. If the screws are over-tightened, the screw threads may be damaged.



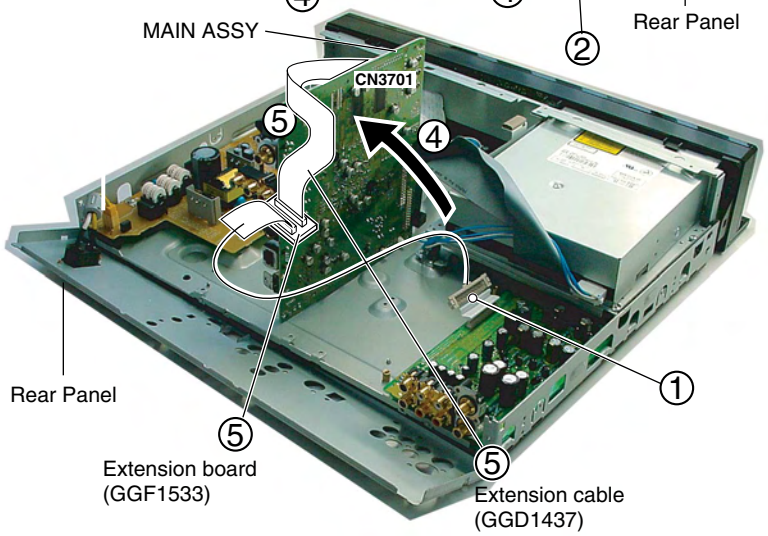
4 Main ASSY

① Unlock the two Clamps.
② Disconnect the three connectors.
③ Remove the two screws. (AMZ30P060FTC)
④ Remove the four screws. (BBZ30P060FTC)
⑤ Remove the tape.
⑥ Remove the MAIN ASSY.



① Dis connect CN5701.
② Remove the two screws. (AMZ30P060FTC)
③ Remove the four screws. (BBZ30P060FTC)
④ Remove the MAIN ASSY.
⑤ Connect GGF1533 and GGD1437.

Diagnosis



7.3 PARTS
7.3.1 IC

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

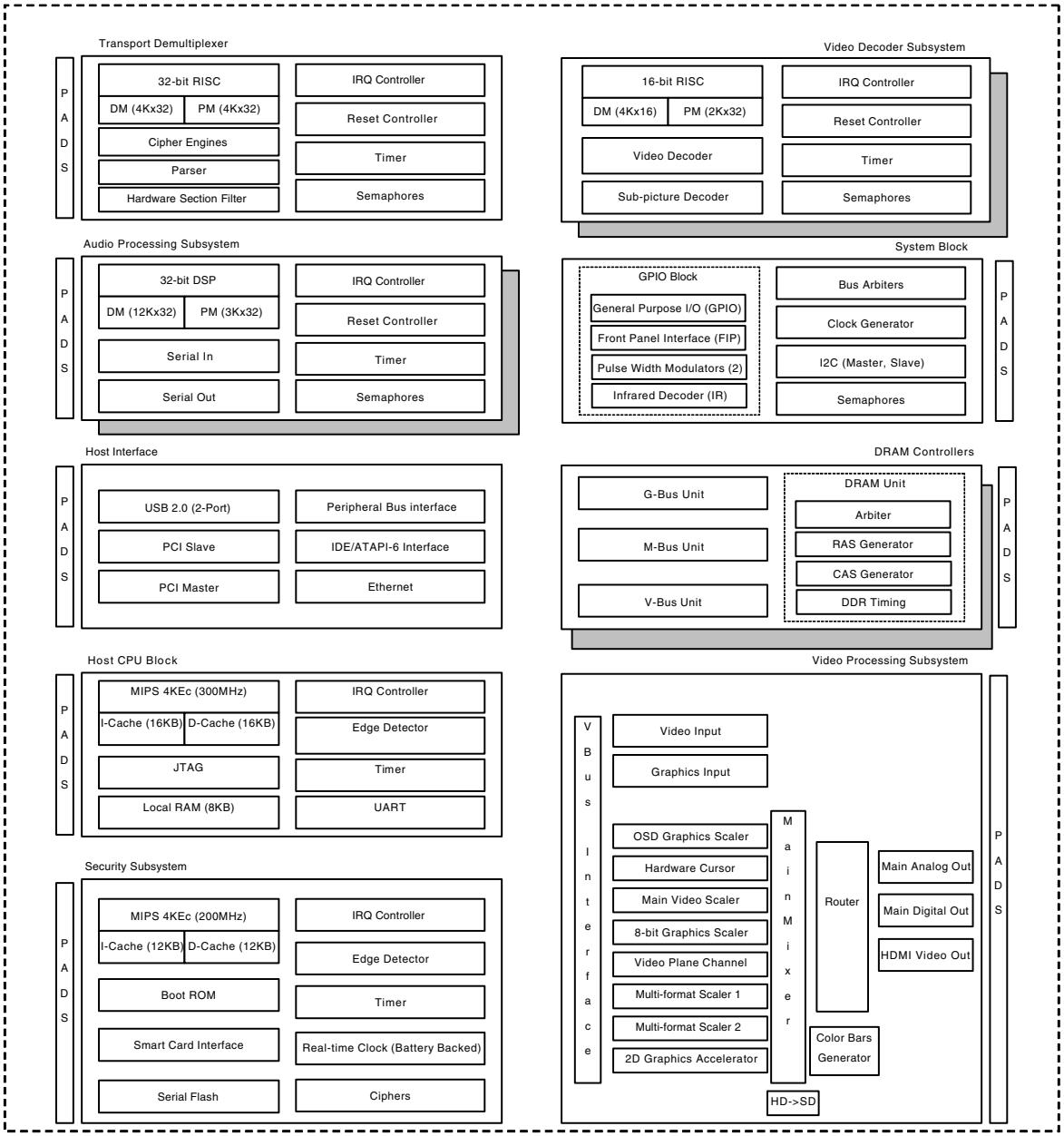
● **List of IC**

SMP8634LF-A, SM5302AS, RTL8201CP-LF, K4H510838C, K4H511638C, PCM1738EG

■ SMP8634LF-A (IC1001)

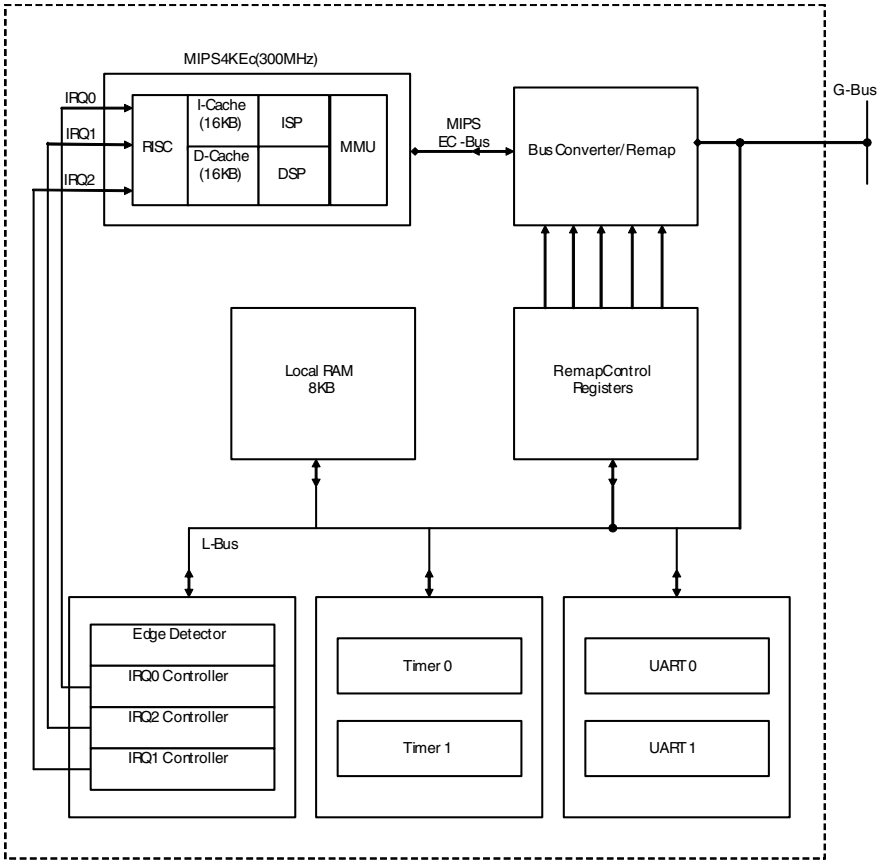
• MAIN LSI

● **Block Diagram**



■ HOST CPU BLOCK

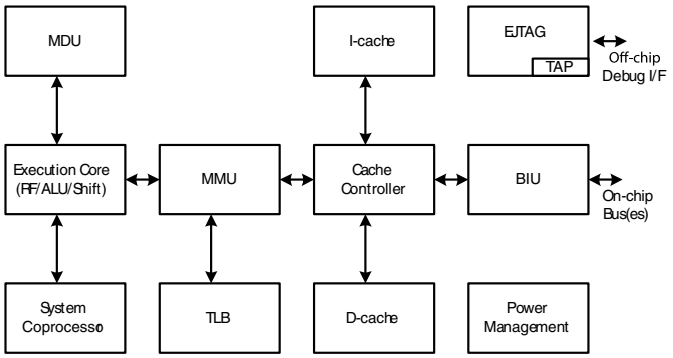
● Block Diagram



■ HOST CPU BLOCK

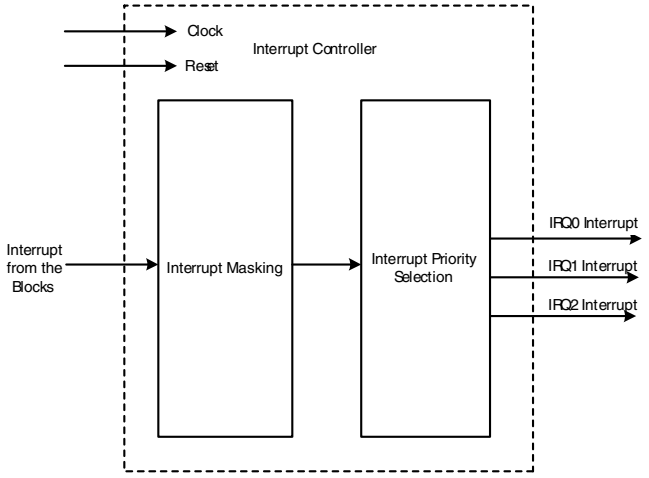
• 4KEc Core

● Block Diagram



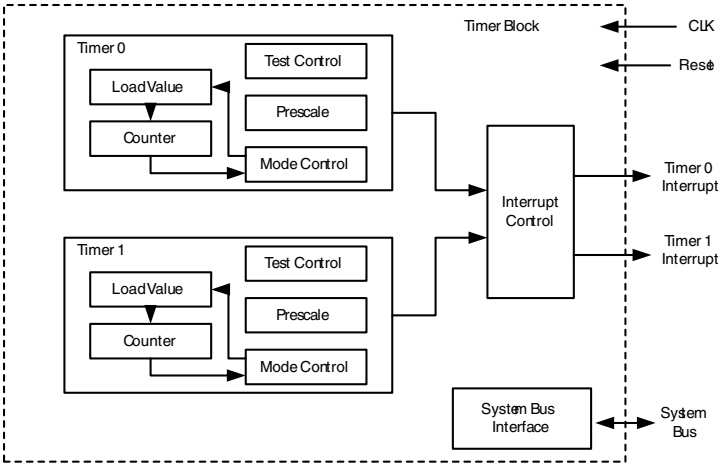
■ HOST CPU BLOCK
• Interrupt Controller

● Block Diagram



■ HOST CPU BLOCK
• Timer

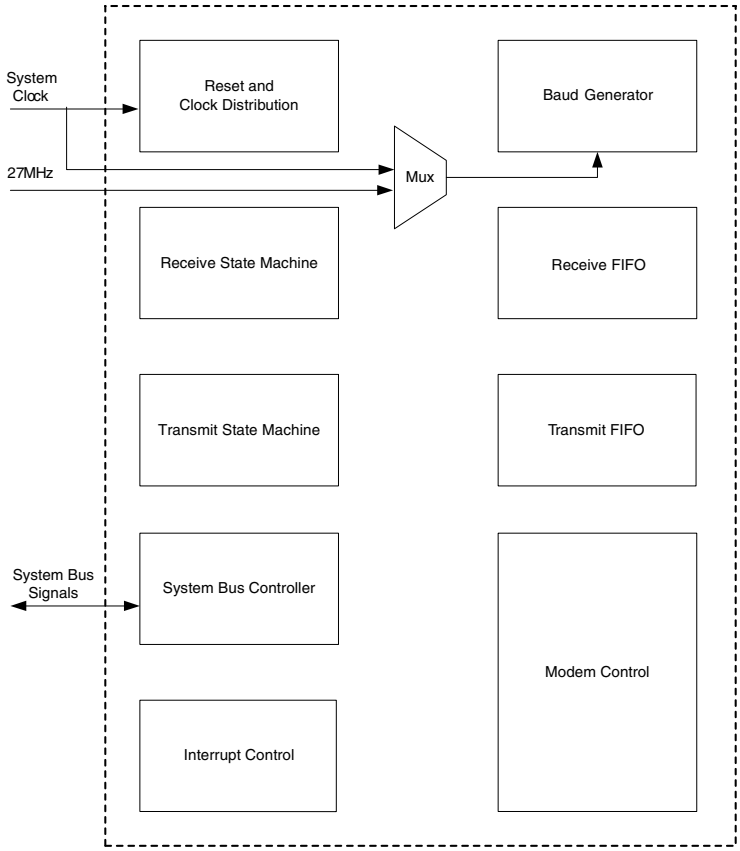
● Block Diagram



■ HOST CPU BLOCK

• Uart

● Block Diagram

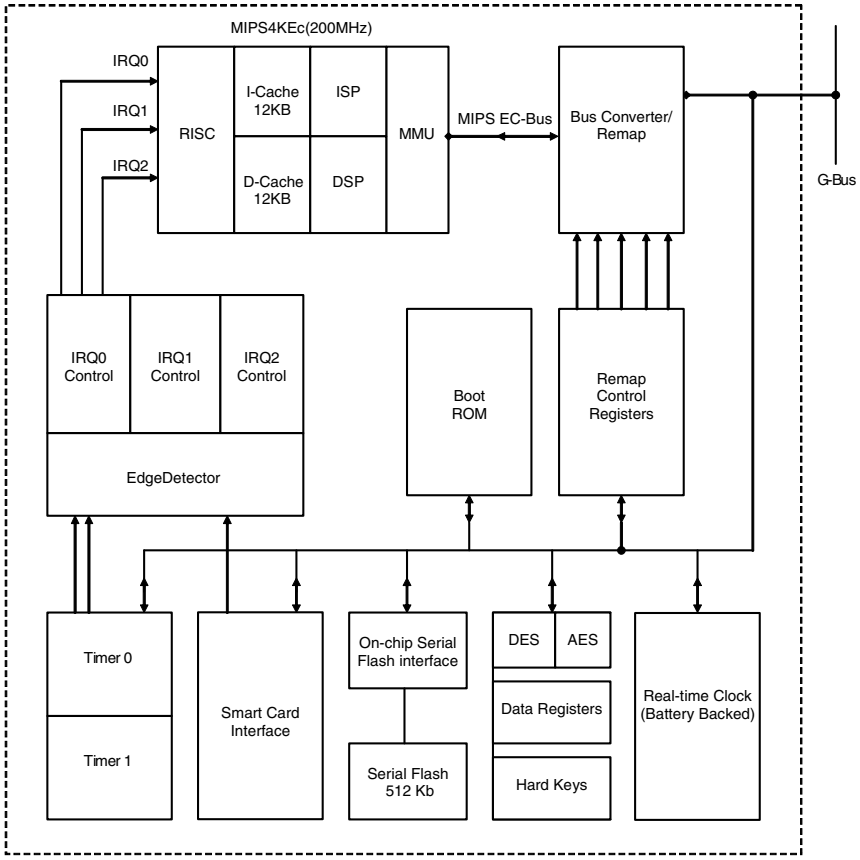


● Pin Function

Pin Name	Ball ID	Direction	Description
UART0_CTS	B14	B	UART 0 clear to send. Flow control signal.
UART0_DCD	B12	B	UART 0 data carrier detect. Data set status signal.
UART0_DSR	C14	B	UART 0 data set ready. Data set status signal.
UART0_DTR	C13	B	UART 0 data terminal ready. Data terminal status signal.
UART0_RTS	B13	B	UART 0 request to send. Flow control signal.
UART0_RX	A14	B	UART 0 receive data input
UART0_TX	A13	B	UART 0 transmit data output
UART1_CTS	C12	B	UART 1 clear to send. Flow control signal.
UART1_DCD	C11	B	UART 1 data carrier detect. Data set status signal.
UART1_DSR	B11	B	UART 1 data set ready. Data set status signal.
UART1_DTR	C10	B	UART 1 data terminal ready. Data terminal status signal.
UART1_RTS	B10	B	UART 1 request to send. Flow control signal.
UART1_RX	A12	B	UART 1 receive data input
UART1_TX	A11	B	UART 1 transmit data output

■ SECURITY SUBSYSTEM

● Block Diagram



■ SECURITY SUBSYSTEM

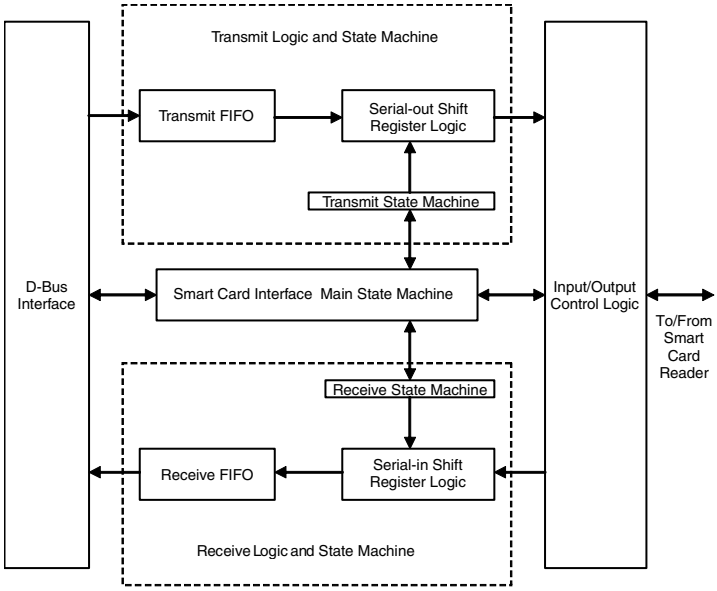
• Real-time Clock

● Pin Function

Pin Name	Ball ID	Direction	Description
RTC_CLK_IN	AN24	I	Reserved. Make no connection to this pin (internal pull-down).
RTC_CLK_OUT	AP23	O	RTC clock output
RTC_RING	AM24	O	RTC ring output
RTC_TEST	AM25	I	RTC test input
RTC_VDD_BAT_3V3	AL24	I	RTC crystal oscillator power (3.3V)
RTC_VDD_BAT_3V3	AL25	I	RTC battery power (3.3V)
RTC_VSS	AK24	I	RTC crystal oscillator ground
RTC_XTAL_DISC	AN25	I	Reserved. Make no connection to this pin (internal pull-down).
RTC_XTAL_IN	AP24	I	RTC 32KHz crystal oscillator input
RTC_XTAL_OUT	AP25	O	RTC 32KHz crystal oscillator output

■SECURITY SUBSYSTEM
•Smart Card Interface

● Block Diagram

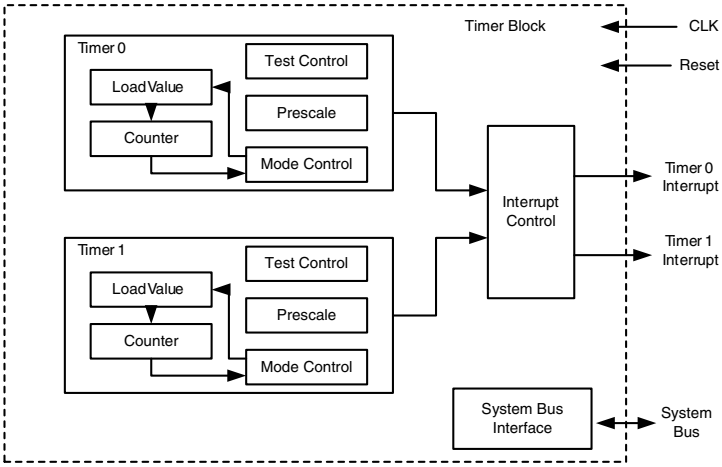


● Pin Function

Pin Name	Ball ID	Direction	Description
SCARD_CLK	A16	O	Smart card clock
SCARD_CTL0	C15	B	Smart card control 1
SCARD_CTL1	D16	B	Smart card control 2
SCARD_CTL2	E16	B	Smart card control 3
SCARD_FC#	B16	O	Smart card function code
SCARD_IO	A15	B	Smart card IO
SCARD_RST	B15	O	Smart card reset

■SECURITY SUBSYSTEM
•Timer

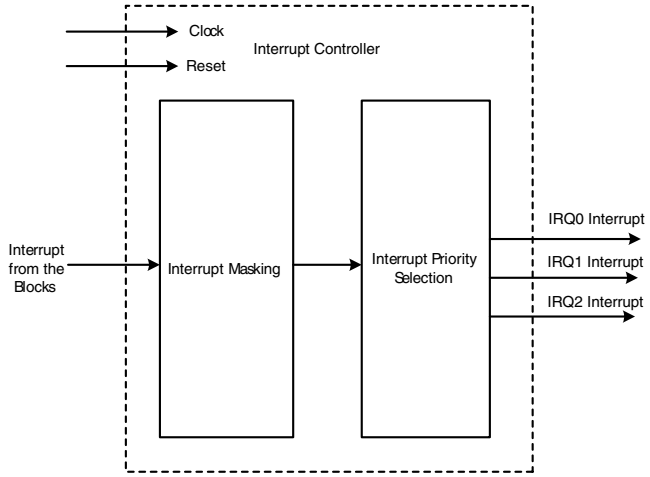
● Block Diagram



■ SECURITY SUBSYSTEM

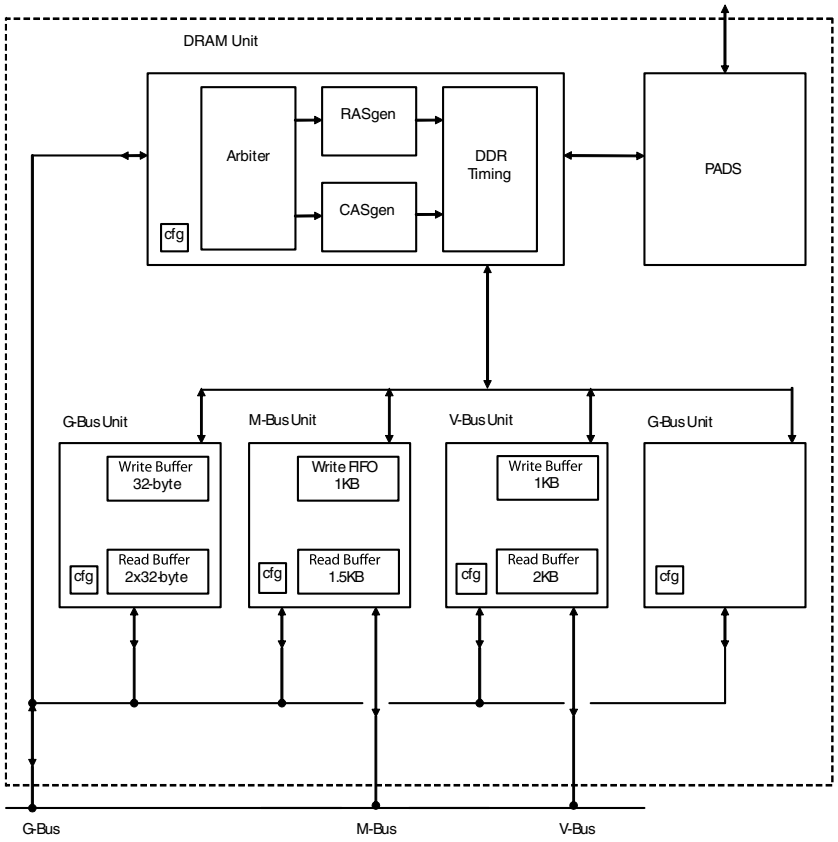
• Interrupt Controller

● Block Diagram



■ DRAM CONTROLLER

● Block Diagram



● Pin Function

Pin Name	Ball Id	Direction	Description
DRAM0_A0	V34	O	Memory address bit 0
DRAM0_A1	V33	O	Memory address bit 1
DRAM0_A10	U32	O	Memory address bit 10
DRAM0_A11	T30	O	Memory address bit 11
DRAM0_A12	R31	O	Memory address bit 12
DRAM0_A13	R33	O	Memory address bit 13. Memory address bus provides the SDRAM with the row address for the active commands, and the column address and the auto-precharge value for read/write commands.
DRAM0_A2	V32	O	Memory address bit 2
DRAM0_A3	W31	O	Memory address bit 3
DRAM0_A4	W30	O	Memory address bit 4
DRAM0_A5	V31	O	Memory address bit 5
DRAM0_A6	V30	O	Memory address bit 6
DRAM0_A7	U31	O	Memory address bit 7
DRAM0_A8	U30	O	Memory address bit 8
DRAM0_A9	T31	O	Memory address bit 9
DRAM0_BA0	U34	O	Bank address output 0
DRAM0_BA1	U33	O	Bank address output 1. BA[1:0] define to which SDRAM bank an active, read, write or precharge command is being applied.
DRAM0_CAS#	T34	O	Column address strobe. Memory command output. In conjunction with CAS# and WE#, this signal determines the memory operation requested (active-low).
DRAM0_CK	K34	O	Non-inverted clock output. CK and CK# are a differential clock signal pair. The SDRAM0 address and control signals are sampled on the crossing of the positive edge of CK and the negative edge of CK#. SDRAM output (read) data is referenced to the crossings of CK and CK# in both directions.
DRAM0_CK#	L34	O	Inverted clock output. CK and CK# are a differential clock signal pair. The SDRAM address and control signals are sampled on the crossing of the positive edge of CK and the negative edge of CK#. SDRAM output (read) data is referenced to the crossings of CK and CK# in both directions (active-low).
DRAM0_CKE	R30	O	Clock enable. A high level activates, and a low level deactivates the internal clock signals in the SDRAM. This signal is driven low to activate the SDRAM power-down modes.
DRAM0_DM0	H33	O	Write data mask for bits [07:00] of memory data
DRAM0_DM1	H32	O	Write data mask for bits [15:08] of memory data
DRAM0_DM2	N33	O	Write data mask for bits [23:16] of memory data
DRAM0_DM3	N34	O	Write data mask for bits [31:24] of memory data. Write data is masked when the corresponding DM bit is sampled high by the SDRAM during a write access.
DRAM0_DQ0	K31	B	Memory data bus bit 0 (LSB)
DRAM0_DQ1	K30	B	Memory data bus bit 1
DRAM0_DQ10	G33	B	Memory data bus bit 10
DRAM0_DQ11	G32	B	Memory data bus bit 11
DRAM0_DQ12	G30	B	Memory data bus bit 12
DRAM0_DQ13	G31	B	Memory data bus bit 13
DRAM0_DQ14	F34	B	Memory data bus bit 14

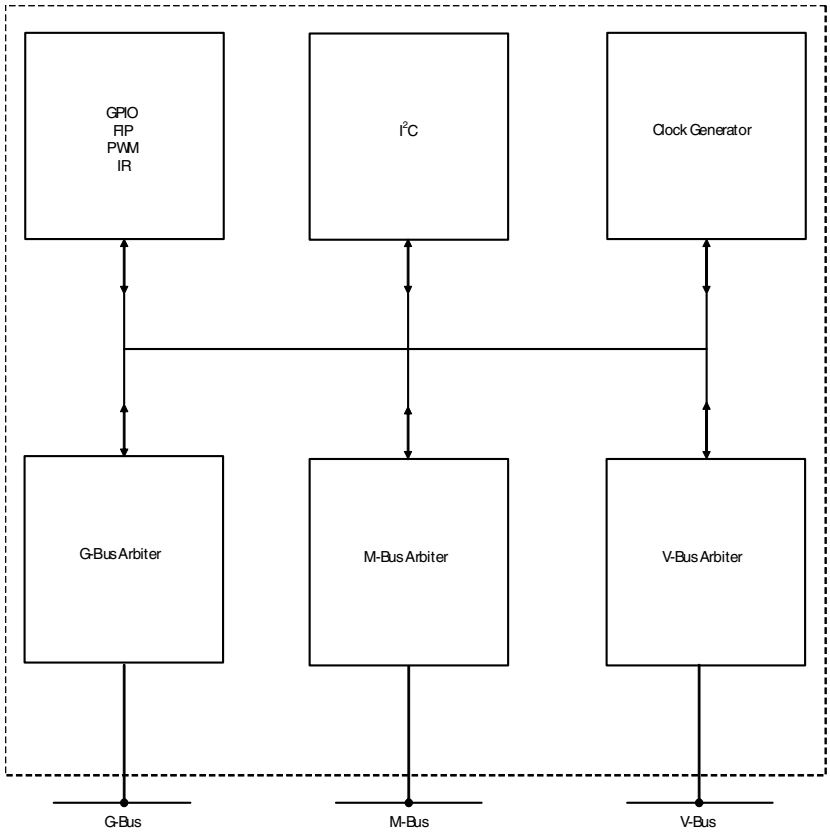
Pin Name	Ball Id	Direction	Description
DRAM0_DQ15	F33	B	Memory data bus bit 15
DRAM0_DQ16	R34	B	Memory data bus bit 16
DRAM0_DQ17	P31	B	Memory data bus bit 17
DRAM0_DQ18	P30	B	Memory data bus bit 18
DRAM0_DQ19	P32	B	Memory data bus bit 19
DRAM0_DQ2	K33	B	Memory data bus bit 2
DRAM0_DQ20	P33	B	Memory data bus bit 20
DRAM0_DQ21	P34	B	Memory data bus bit 21
DRAM0_DQ22	N31	B	Memory data bus bit 22
DRAM0_DQ23	N30	B	Memory data bus bit 23
DRAM0_DQ24	M30	B	Memory data bus bit 24
DRAM0_DQ25	M32	B	Memory data bus bit 25
DRAM0_DQ26	M33	B	Memory data bus bit 26
DRAM0_DQ27	M34	B	Memory data bus bit 27
DRAM0_DQ28	L31	B	Memory data bus bit 28
DRAM0_DQ29	L30	B	Memory data bus bit 29
DRAM0_DQ3	K32	B	Memory data bus bit 3
DRAM0_DQ30	L32	B	Memory data bus bit 30
DRAM0_DQ31	L33	B	Memory data bus bit 31 (MSB)
DRAM0_DQ4	J34	B	Memory data bus bit 4
DRAM0_DQ5	J33	B	Memory data bus bit 5
DRAM0_DQ6	J32	B	Memory data bus bit 6
DRAM0_DQ7	J31	B	Memory data bus bit 7
DRAM0_DQ8	H31	B	Memory data bus bit 8
DRAM0_DQ9	G34	B	Memory data bus bit 9
DRAM0_DQS0	H34	B	Data strobes for bits 07:00 of memory data
DRAM0_DQS1	H30	B	Data strobes for bits [15:08] of memory data
DRAM0_DQS2	N32	B	Data strobes for bits [23:16] of memory data
DRAM0_DQS3	M31	B	Data strobes for bits [31:24] of memory data bus. Output by the SMP8634 with the write data; output by the SDRAM with the read data.
DRAM0_RAS#	T33	O	Memory command output. In conjunction with WE#, this signal determines the memory operation requested.
DRAM0_CS#	T32	O	Chip select (active low)
DRAM0_VREFSSTL0	L29	I	SSTL-2 voltage reference input (1.25V)
DRAM0_VREFSSTL1	J30	I	SSTL-2 voltage reference input (1.25V)
DRAM0_VREFSSTL2	G29	I	SSTL-2 voltage reference input (1.25V)
DRAM0_WE#	R32	O	Write enable (active-low). Memory command output. In conjunction with CAS# and WE#, this signal determines the memory operation requested.
DRAM1_A0	B34	O	Memory address bit 0
DRAM1_A1	C34	O	Memory address bit 1
DRAM1_A10	C33	O	Memory address bit 10
DRAM1_A11	E31	O	Memory address bit 11
DRAM1_A12	F31	O	Memory address bit 12

Pin Name	Ball Id	Direction	Description
DRAM1_A13	B31	O	Memory address bit 13. Memory address bus provides the SDRAM with the row address for the active commands, and the column address and the auto-precharge value for read/write commands.
DRAM1_A2	D34	O	Memory address bit 2
DRAM1_A3	E34	O	Memory address bit 3
DRAM1_A4	D33	O	Memory address bit 4
DRAM1_A5	E33	O	Memory address bit 5
DRAM1_A6	D32	O	Memory address bit 6
DRAM1_A7	E32	O	Memory address bit 7
DRAM1_A8	F32	O	Memory address bit 8
DRAM1_A9	D31	O	Memory address bit 9
DRAM1_BA0	A33	O	Bank address output 0
DRAM1_BA1	B33	O	Bank address output 1. BA[1:0] define to which SDRAM bank an active, read, write or precharge command is being applied.
DRAM1_CAS#	A32	O	Column address strobe (active-low). Memory command output. In conjunction with WE#, this signal determines the memory operation requested.
DRAM1_CK	A26	O	Non-inverted clock output. CK and CK# are a differential clock signal pair. SDRAM address and control signals are sampled on the crossing of the positive edge of CK and the negative edge of CK#. SDRAM output (read) data is referenced to the crossings of CK and CK# in both directions.
DRAM1_CK#	A27	O	Inverted clock output. CK and CK# are a differential clock signal pair. SDRAM address and control signals are sampled on the crossing of the positive edge of CK and the negative edge of CK#. SDRAM output (read) data is referenced to the crossings of CK and CK# in both directions (active-low).
DRAM1_CKE	F30	O	Clock enable. A high level activates, and a low level deactivates the internal clock signals in the SDRAM. This signal is driven low to activate the SDRAM power-down modes.
DRAM1_DM0	B24	O	Write data mask for bits [07:00] of memory data
DRAM1_DM1	C24	O	Write data mask for bits [15:08] of memory data
DRAM1_DM2	B29	O	Write data mask for bits [23:16] of memory data
DRAM1_DM3	A29	O	Write data mask for bits [31:24] of memory data. Write data is masked when the corresponding DM bit is sampled high by the SDRAM during a write access.
DRAM1_DQ0	D26	B	Memory data bus bit 0 (LSB)
DRAM1_DQ1	E26	B	Memory data bus bit 1
DRAM1_DQ10	B23	B	Memory data bus bit 10
DRAM1_DQ11	C23	B	Memory data bus bit 11
DRAM1_DQ12	D23	B	Memory data bus bit 12
DRAM1_DQ13	A22	B	Memory data bus bit 13
DRAM1_DQ14	B22	B	Memory data bus bit 14
DRAM1_DQ15	C22	B	Memory data bus bit 15
DRAM1_DQ16	A31	B	Memory data bus bit 16
DRAM1_DQ17	D30	B	Memory data bus bit 17
DRAM1_DQ18	E30	B	Memory data bus bit 18
DRAM1_DQ19	C30	B	Memory data bus bit 19
DRAM1_DQ2	B26	B	Memory data bus bit 2

Pin Name	Ball Id	Direction	Description
DRAM1_DQ20	B30	B	Memory data bus bit 20
DRAM1_DQ21	A30	B	Memory data bus bit 21
DRAM1_DQ22	D29	B	Memory data bus bit 22
DRAM1_DQ23	E29	B	Memory data bus bit 23
DRAM1_DQ24	E28	B	Memory data bus bit 24
DRAM1_DQ25	C28	B	Memory data bus bit 25
DRAM1_DQ26	B28	B	Memory data bus bit 26
DRAM1_DQ27	A28	B	Memory data bus bit 27
DRAM1_DQ28	D27	B	Memory data bus bit 28
DRAM1_DQ29	E27	B	Memory data bus bit 29
DRAM1_DQ3	C26	B	Memory data bus bit 3
DRAM1_DQ30	C27	B	Memory data bus bit 30
DRAM1_DQ31	B27	B	Memory data bus bit 31 (MSB)
DRAM1_DQ4	A25	B	Memory data bus bit 4
DRAM1_DQ5	B25	B	Memory data bus bit 5
DRAM1_DQ6	C25	B	Memory data bus bit 6
DRAM1_DQ7	D25	B	Memory data bus bit 7
DRAM1_DQ8	D24	B	Memory data bus bit 8
DRAM1_DQ9	A23	B	Memory data bus bit 9
DRAM1_DQS0	A24	B	Data strobes for bits 07:00 of memory data
DRAM1_DQS1	E24	B	Data strobes for bits [15:08] of memory data
DRAM1_DQS2	C29	B	Data strobes for bits [23:16] of memory data
DRAM1_DQS3	D28	B	Data strobes for bits [31:24] of memory data bus. Output by the SMP8634 with the write data; output by the SDRAM with the read data.
DRAM1_RAS#	B32	O	DRAM1 row address strobe (active-low). Memory command output. In conjunction with CAS# and WE#, this signal determines the memory operation requested.
DRAM1_CS#	C32	O	DRAM1 chip select (active-low).
DRAM1_VREFSSTL0	F28	I	SSTL-2 voltage reference input (1.25V)
DRAM1_VREFSSTL1	E25	I	SSTL-2 voltage reference input (1.25V)
DRAM1_VREFSSTL2	E23	I	SSTL-2 voltage reference input (1.25V)
DRAM1_WE#	C31	O	DRAM1 write enable (active-low). Memory command output. In conjunction with CAS# and WE#, this signal determines the memory operation requested.

■SYSTEM BLOCK

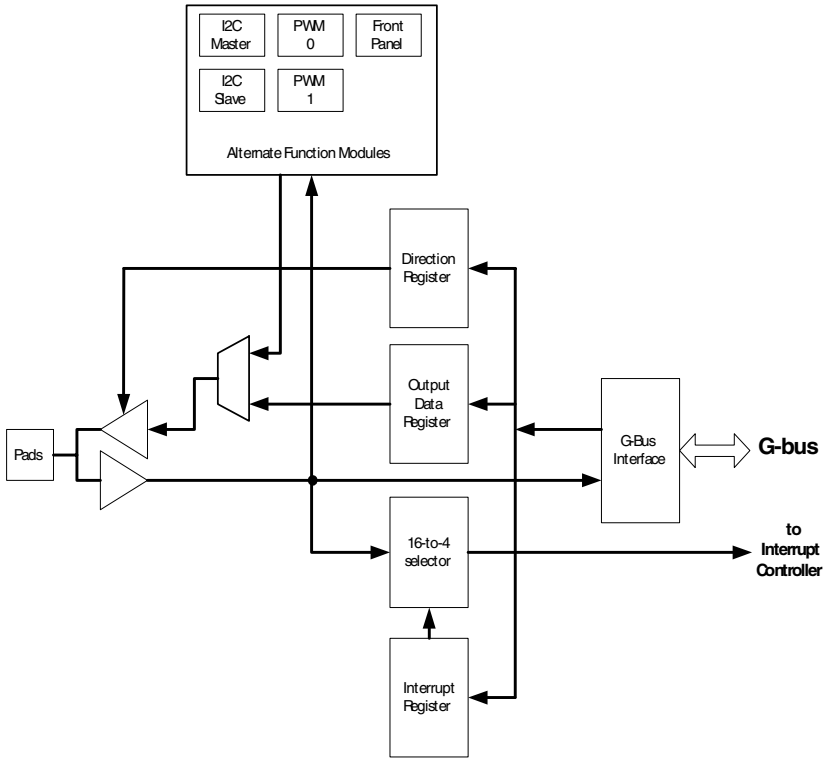
● Block Diagram



■SYSTEM BLOCK

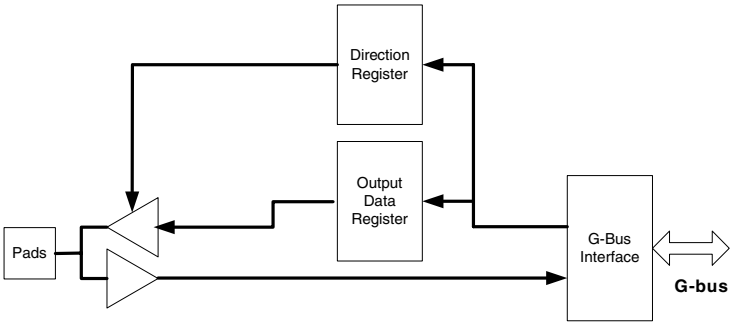
• LBC General

● Block Diagram



■ SYSTEM BLOCK
• HBCGeneral

● Block Diagram



■ SYSTEM BLOCK
• General Purpose I/O (GPIO)

● Pin Function

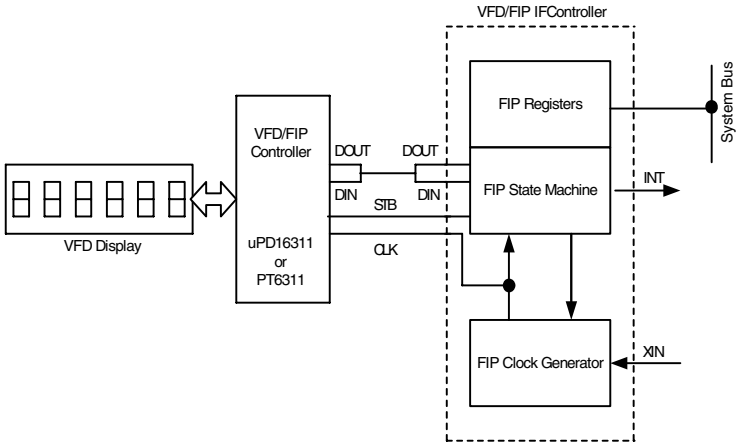
Pin Name	Ball ID	Direction	Description
GPIO0	A5	B	General-purpose IO pin 0 Alternate function: Master I^2C.
GPIO1	B5	B	General-purpose IO pin 1 Alternate function: Master I^2C.
GPIO10	E6	B	General-purpose IO pin 10 Selectable input: (PCI) Interrupt Input C.
GPIO11	E8	B	General-purpose IO pin 11 Selectable input: (PCI) Interrupt Input D.
GPIO12	B7	B	General-purpose IO pin 12 Selectable input: Infrared Remote input.
GPIO13	C7	B	General-purpose IO pin 13
GPIO14	D7	B	General-purpose IO pin 14 Alternate function: PWM generator 1.
GPIO15	E7	B	General-purpose IO pin 15 Alternate function: PWM generator 0.
GPIO16	AF5	B	General-purpose IO pin 16
GPIO17	AF4	B	General-purpose IO pin 17
GPIO18	AF3	B	General-purpose IO pin 18
GPIO19	AF2	B	General-purpose IO pin 19
GPIO2	C5	B	General-purpose IO pin 2 Alternate function: Front Panel Interface (FIP).
GPIO20	AE5	B	General-purpose IO pin 20
GPIO21	AE4	B	General-purpose IO pin 21
GPIO22	AE3	B	General-purpose IO pin 22
GPIO23	AE2	B	General-purpose IO pin 23
GPIO24	AD5	B	General-purpose IO pin 24
GPIO25	AD4	B	General-purpose IO pin 25
GPIO26	AD3	B	General-purpose IO pin 26
GPIO27	AD2	B	General-purpose IO pin 27
GPIO28	AC5	B	General-purpose IO pin 28
GPIO29	AC4	B	General-purpose IO pin 29

Pin Name	Ball Id	Direction	Description
GPIO3	D5	B	General-purpose IO pin 3 Alternate function: Front Panel Interface (FIP).
GPIO30	AB5	B	General-purpose IO pin 30
GPIO31	AB4	B	General-purpose IO pin 31
GPIO4	D4	B	General-purpose IO pin 4 Alternate function: Front Panel Interface (FIP).
GPIO5	E4	B	General-purpose IO pin 5 Alternate function: Front Panel Interface (FIP).
GPIO6	E5	B	General-purpose IO pin 6 Alternate function: Slave I^2C.
GPIO7	B6	B	General-purpose IO pin 7 Alternate function: Slave I^2C.
GPIO8	C6	B	General-purpose IO pin 8 Selectable input: (PCI) Interrupt Input A.
GPIO9	D6	B	General-purpose IO pin 9 Selectable input: (PCI) Interrupt Input B.

■ SYSTEM BLOCK

• Front Panel Controller Interface (FIP)

● Block Diagram

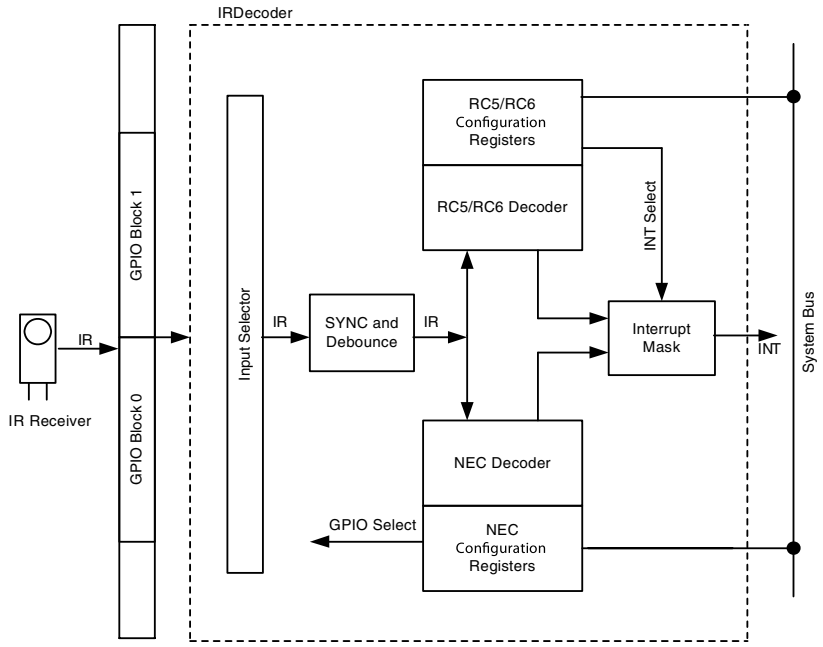


● Pin Function

Pin Name	Ball ID	Direction	Description
GPIO2	C5	B	FIP serial data input
GPIO3	D5	B	FIP serial data output
GPIO4	D4	B	FIP data strobe
GPIO5	E4	B	FIP serial I/O clock

■ SYSTEM BLOCK
• Infrared Decoder

● Block Diagram

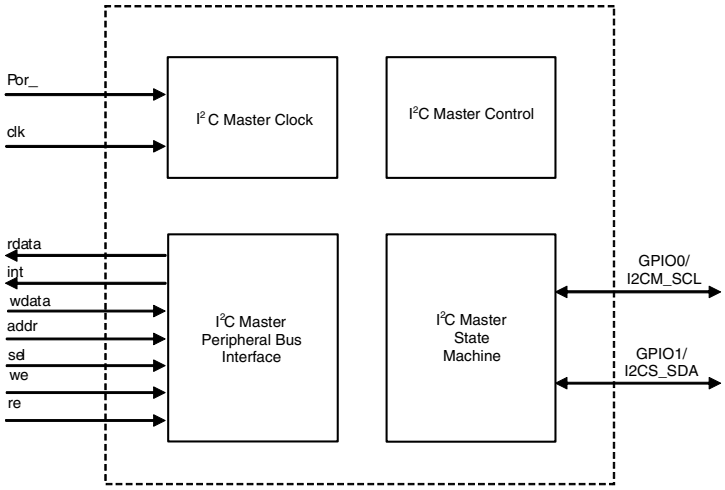


● Pin Function

Pin Name	Ball ID	Direction	Description
GPIO12	B7	B	Default pin assigned to the IR decoder input function (may be mapped to any other GPIO pin under the software control).

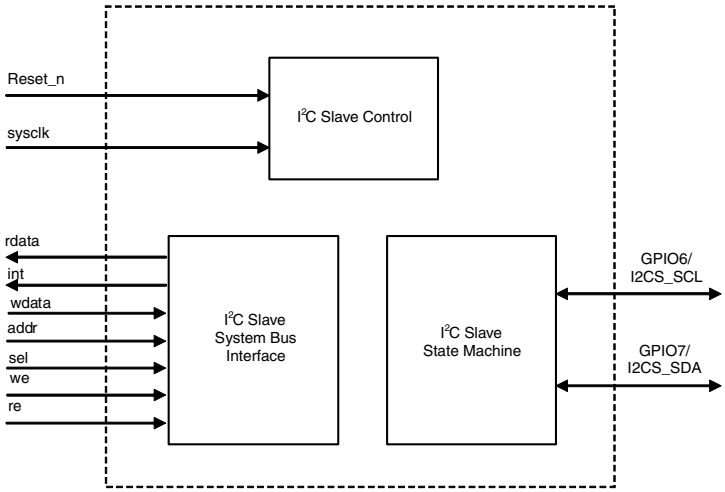
■ SYSTEM BLOCK
• I²C Master

● Block Diagram



■ SYSTEM BLOCK
•I²C Slave

● Block Diagram



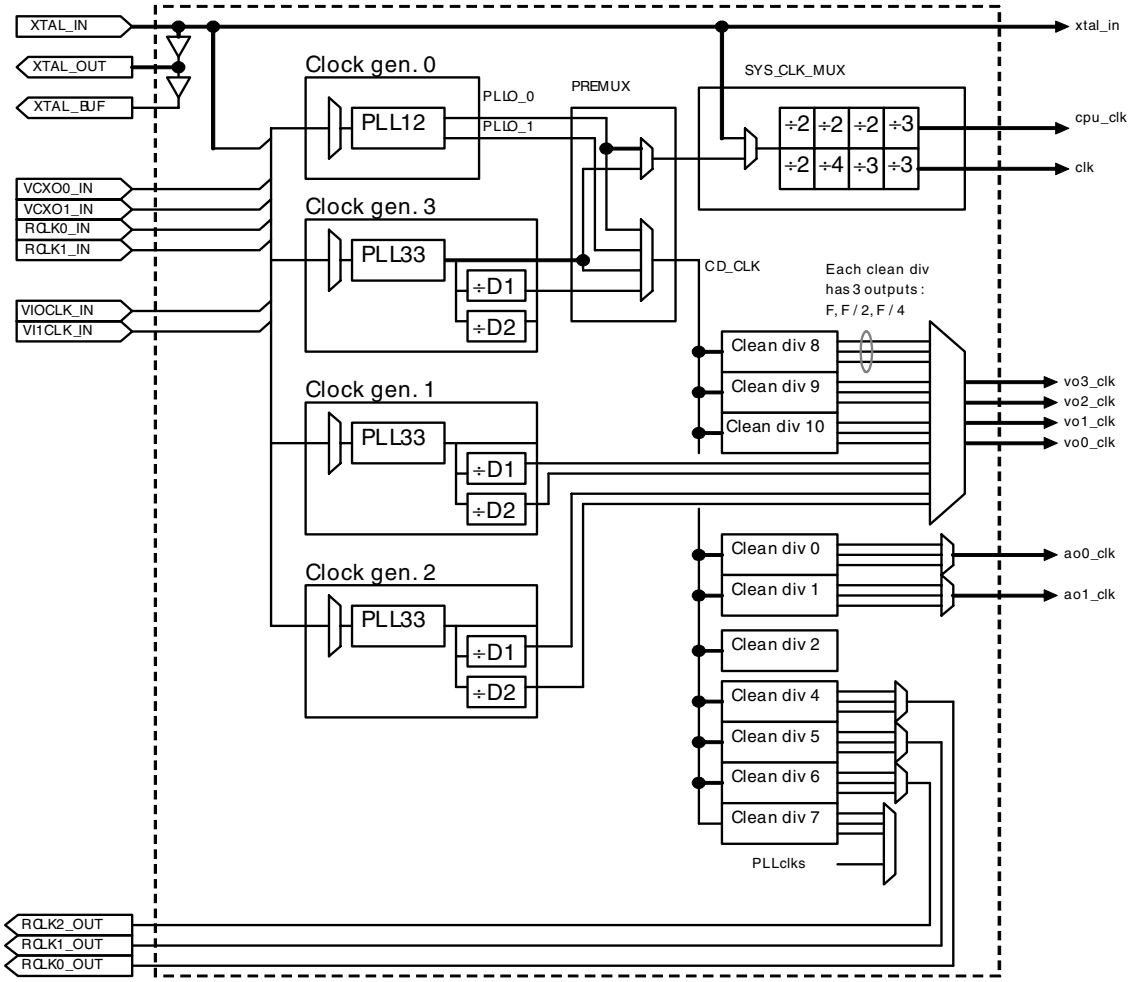
■ SYSTEM BLOCK
•I²C Master and Slave Interface

● Pin Function

Pin Name	Ball ID	Direction	Description
GPIO0	A5	B	I2CM_SCL. I²C master interface serial clock
GPIO1	B5	B	I2CM_SDA. I²C master interface serial data
GPIO6	E5	B	I2CS_SCL. I²C slave interface serial clock
GPIO7	B6	B	I2CS_SDA. I²C slave interface serial data

■ SYSTEM BLOCK
• Clock Generator

● Block Diagram

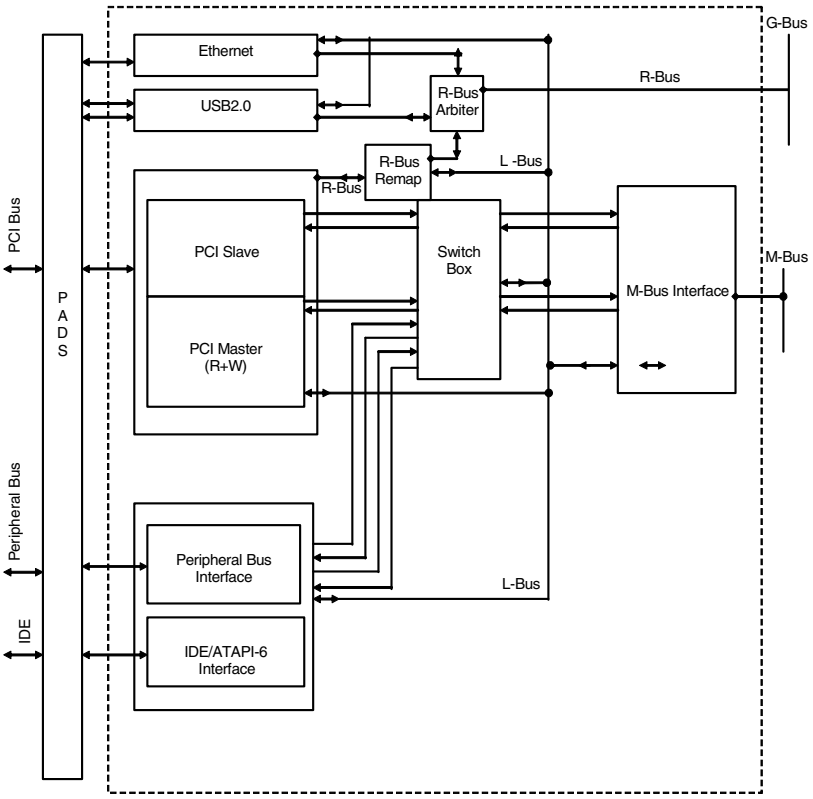


● Pin Function

Pin Name	Ball ID	Direction	Description
XTAL_IN	A10	I	27MHz crystal oscillator input
XTAL_OUT	A9	O	Crystal oscillator output
XTAL_BUF	B9	O	Buffered crystal oscillator output
VCXO0_IN	C9	I	Input from external VCXO #0
VCXO1_IN	C8	I	Input from external VCXO #1
RCLK0_IN	B8	I	PLL reference clock input #0
RCLK0_OUT	D8	O	PLL reference clock output #0
RCLK1_OUT	D9	O	Auxiliary clock output #1
RCLK1_XTAL_IN	A7	I	Crystal oscillator input
RCLK1_XTAL_OUT	A6	O	Crystal oscillator output

■ HOST INTERFACE

● Block Diagram



■ HOST INTERFACE

• System Bus

● Pin Function

Pin name	Ball ID	Direction	Description
PCI_AD0	AL19	B	PCI address/data pin 0 (LSB)
PCI_AD1	AN19	B	PCI address/data pin 1
PCI_AD10	AN17	B	PCI address/data pin 10
PCI_AD11	AL17	B	PCI address/data pin 11
PCI_AD12	AM17	B	PCI address/data pin 12
PCI_AD13	AL16	B	PCI address/data pin 13
PCI_AD14	AN16	B	PCI address/data pin 14
PCI_AD15	AK16	B	PCI address/data pin 15
PCI_AD16	AK15	B	PCI address/data pin 16
PCI_AD17	AP14	B	PCI address/data pin 17
PCI_AD18	AK14	B	PCI address/data pin 18
PCI_AD19	AP13	B	PCI address/data pin 19
PCI_AD2	AK19	B	PCI address/data pin 2
PCI_AD20	AL13	B	PCI address/data pin 20
PCI_AD21	AN13	B	PCI address/data pin 21
PCI_AD22	AM14	B	PCI address/data pin 22
PCI_AD23	AN12	B	PCI address/data pin 23

Pin name	Ball ID	Direction	Description
PCI_AD24	AL11	B	PCI address/data pin 24
PCI_AD25	AN11	B	PCI address/data pin 25
PCI_AD26	AM12	B	PCI address/data pin 26
PCI_AD27	AP11	B	PCI address/data pin 27
PCI_AD28	AL10	B	PCI address/data pin 28
PCI_AD29	AN10	B	PCI address/data pin 29
PCI_AD3	AM19	B	PCI address/data pin 3
PCI_AD30	AM11	B	PCI address/data pin 30
PCI_AD31	AP10	B	PCI address/data pin 31 (MSB). The address and the data are multiplexed on the AD pins during the memory and the I/O operations on the PCI bus.
PCI_AD4	AK17	B	PCI address/data pin 4
PCI_AD5	AP18	B	PCI address/data pin 5
PCI_AD6	AK18	B	PCI address/data pin 6
PCI_AD7	AN18	B	PCI address/data pin 7
PCI_AD8	AP17	B	PCI address/data pin 8
PCI_AD9	AM18	B	PCI address/data pin 9
PCI_CBE0#	AL18	B	Command/byte enable pin 0. Applies to PCI_AD(7:0).
PCI_CBE1#	AP16	B	Command/byte enable pin 1. Applies to PCI_AD(15:8).
PCI_CBE2#	AN14	B	Command/byte enable pin 2. Applies to PCI_AD(23:16).
PCI_CBE3#	AP12	B	Command/byte enable pin 3. During the address phase of a transaction the CBE(3:0)# defines the PCI command. During the data phase each signal indicates whether the associated data byte will be transferred. The CBE3# applies to PCI_AD(31:24).
PCI_CLK	AP8	I	Clock input for PCI interface section. Either 33MHz or a 66MHz clock signal.
PCI_DEVSEL#	AP15	B	Device select pin. A target asserts DEVSEL# when it decodes its address.
PCI_FRAME#	AL14	B	Cycle frame pin. Current initiator asserts the FRAME# pin to indicate the start and duration of a transaction.
PCI_GNTB0	AP9	O	PCI host mode: Bus grant for master #0. Asserted low to grant the PCI ownership to an external master. PCI device mode: Bus request output to an external PCI host.
PCI_GNTB1	AN9	O	PCI host mode: Bus grant for master #1. Asserted low to grant the PCI ownership to an external master. PCI device mode: Unused, make no connection.
PCI_GNTB2	AM10	O	PCI host mode: Bus grant for master #2. Asserted low to grant the PCI ownership to an external master. PCI device mode: Unused, make no connection.
PCI_GNTB3	AM9	O	PCI host mode: Bus grant for master #3. Asserted low to grant the PCI ownership to an external master. PCI device mode: Unused, make no connection.
PCI_IDSEL0	AM13	B	PCI host mode: ID select for PCI device #0. Asserted low by the SMP8634 to indicate a configuration cycle to a PCI device. PCI device mode: Asserted low by an external PCI host to indicate a configuration cycle for the SMP8634.

Pin name	Ball ID	Direction	Description
PCI_IDSEL1	AL12	O	PCI host mode: ID select for PCI device #1. Asserted low by the SMP8634 to indicate a configuration cycle to a PCI device. PCI Device Mode: Unused, make no connection.
PCI_IDSEL2	AK12	O	PCI host mode: ID Select for the PCI device #2. Asserted low by the SMP8634 to indicate a configuration cycle to a PCI device. PCI device mode: Unused, make no connection.
PCI_IDSEL3	AK13	O	PCI host mode: ID Select for the PCI device #3. Asserted low by the SMP8634 to indicate a configuration cycle to a PCI device. PCI device mode: Unused, make no connection.
PCI_INTA#	AN8	B	Interrupt A pin. Asserted by a PCI agent to request an interrupt.
PCI_IRDY#	AM15	B	Initiator ready pin. The current bus master asserts IRDY# to indicate that it is ready to complete a transaction.
PCI_PAR	AM16	B	Parity. Driven by an initiator (write) or currently-addressed target (read) to create even parity across AD(31:0) and CBE(3:0)#.
PCI_REQ0#	AL9	I	PCI host mode: Bus request for master #0. Asserted low by an external master requesting a PCI bus transaction. PCI device mode: Bus grant input from an external PCI host.
PCI_REQ1#	AK9	I	PCI Host Mode: Bus Request for Master #1. Asserted low by external master requesting PCI bus transaction. PCI Device Mode: Unused, make no connection.
PCI_REQ2#	AK10	I	PCI host mode: Bus Request for master #2. Asserted low by external master requesting PCI bus transaction. PCI Device Mode: Unused, make no connection.
PCI_REQ3#	AK11	I	PCI host mode: Bus Request for master #3. Asserted low by external master requesting PCI bus transaction. PCI Device Mode: Unused, make no connection.
PCI_STOP#	AN15	O	Stop pin. Asserted by an addressed target to request the bus master to terminate the current transaction in progress.
PCI_TRDY#	AL15	B	Target ready pin. The currently addressed target asserts TRDY# to indicate that it is ready to complete a transaction.

■ HOST INTERFACE
•USB 2.0

● Pin Function

Pin Name	Ball ID	Direction	Description
USB20_ATEST	AN23	B	USB 2.0 analog test I/O
USB20_DM_0	AP21	B	USB 2.0 line interface - port 0 -DM
USB20_DM_1	AP22	B	USB 2.0 line interface - port 1 -DM
USB20_DP_0	AN21	B	USB 2.0 line interface - port 0 -DP
USB20_DP_1	AN22	B	USB 2.0 line interface - port 1 -DP
USB20_REXT	AN20	B	USB 2.0 bias resistor input
USB20_VSST_0	AL20	I	USB 2.0 ground
USB20_VSSC	AL21	I	USB 2.0 ground
USB20_VDD33C	AL22	I	USB 2.0 analog power supply (3.3V)
USB20_VSST_1	AL23	I	USB 2.0 ground
USB20_VDD33T_0	AM20	I	USB 2.0 analog power supply (3.3V)

Pin name	Ball ID	Direction	Description
USB20_VDD33T_0	AM21	I	USB 2.0 analog power supply (3.3V)
USB20_VDD33T_0	AM22	I	USB 2.0 analog power supply (3.3V)
USB20_VDD33T_1	AM23	I	USB 2.0 analog power supply (3.3V)
USB20_VSST_0	AK20	I	USB 2.0 ground
USB20_VSST_0	AK21	I	USB 2.0 ground
USB20_VSST_1	AK22	I	USB 2.0 ground
USB20_VSST_1	AK23	I	USB 2.0 ground
USB20_XI	AP20	I	USB 2.0 Xtal oscillator input (optional)
USB20_XO	AP19	O	USB 2.0 Xtal oscillator output (optional)

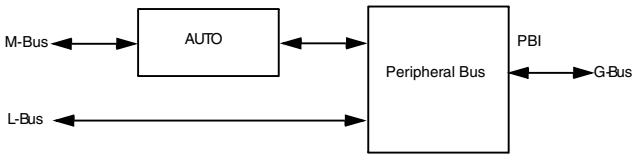
■ HOST INTERFACE
• MII Interface

● Pin Function

Pin Name	Ball ID	Direction	Description
ETH_COL	AC3	B	Ethernet collision detect/GPIO14
ETH_CRS	AA3	B	Ethernet carrier sense/GPIO13
ETH_MDC	AD1	B	Ethernet management data clock/GPIO15
ETH_MDINT#	AA5	B	Ethernet management interrupt/GPIO17
ETH_MDIO	Y4	B	Ethernet management data I/O/GPIO16
ETH_RX_DV	AE1	B	Ethernet receive data valid /GPIO7
ETH_RX_ER	AF1	B	Ethernet receive error/GPIO8
ETH_RXCLK	AC2	B	Ethernet receive clock/GPIO6
ETH_RXD0	AC1	B	Ethernet receive data 0/GPIO9
ETH_RXD1	AB3	B	Ethernet receive data 1/GPIO10
ETH_RXD2	AB2	B	Ethernet receive data 2/GPIO11
ETH_RXD3	AB1	B	Ethernet receive data 3/GPIO12
ETH_TX_EN	AA2	B	Ethernet transmit enable/GPIO1
ETH_TXCLK	AA1	B	Ethernet transmit clock/GPIO0
ETH_TXD0	Y3	B	Ethernet transmit data 0/GPIO2
ETH_TXD1	Y2	B	Ethernet transmit data 1/GPIO3
ETH_TXD2	Y1	B	Ethernet transmit data 2/GPIO4
ETH_TXD3	W1	B	Ethernet transmit data 3/GPIO5

■ HOST INTERFACE
• Peripheral Bus Interface (PBI)

● Block Diagram



■ HOST INTERFACE
• PBI Control

● Pin Function

Signal	Direction	Description
PB_CS#[3:0]	O	Four chip selects (active low)
PB_RD#	O	Read strobe (active low)
PB_WR#	O	Write strobe (active low)
PB_IORDY#	I	Ready - An accessed device can extend the PB transaction by pulling this line low through an open collector.
PB_ALE	O	Address latch enable. In multiplexed address/data mode, this signal indicates when to latch the address.
PB_DIR#	O	Indicates the direction of the current transaction (may be used to control external transceivers).
PB_DMAREQ	I	An external IDE device can request a DMA transfer using this signal
PB_DMAACK	O	DMA acknowledge

■ HOST INTERFACE
• PBI

● Pin Function

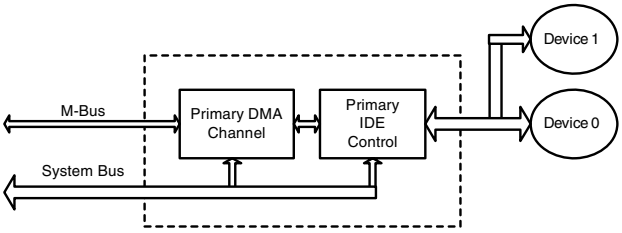
Pin Name	Ball ID	Direction	Description
PB_A0	AM32	O	PBI address bit 0 (LSB)
PB_A1	AN32	O	PBI address bit 1
PB_A10	AN30	O	PBI address bit 10
PB_A11	AP30	O	PBI address bit 11
PB_A12	AK29	O	PBI address bit 12
PB_A13	AL29	O	PBI address bit 13
PB_A14	AM29	O	PBI address bit 14
PB_A15	AN29	O	PBI address bit 15 (MSB). Provides address for non-multiplexed bus cycles.
PB_A16	AP29	O	PBI address bit 16
PB_A17	AL28	O	PBI address bit 17
PB_A18	AM28	O	PBI address bit 18
PB_A19	AN28	O	PBI address bit 19
PB_A2	AP32	O	PBI address bit 2
PB_A20	AP28	O	PBI address bit 20
PB_A21	AL27	O	PBI address bit 21
PB_A22	AM27	O	PBI address bit 22
PB_A23	AN27	O	PBI address bit 23
PB_A24	AP27	O	PBI address bit 24
PB_A3	AM31	O	PBI address bit 3
PB_A4	AN31	O	PBI address bit 4
PB_A5	AP31	O	PBI address bit 5
PB_A6	AJ30	O	PBI address bit 6
PB_A7	AK30	O	PBI address bit 7
PB_A8	AL30	O	PBI address bit 8

Pin Name	Ball ID	Direction	Description
PB_A9	AM30	O	PBI address bit 9
PB_AD0	AK34	B	Multiplexed address/data bit 0 (LSB)
PB_AD1	AK33	B	Multiplexed address/data bit 1
PB_AD10	AH32	B	Multiplexed address/data bit 10
PB_AD11	AH31	B	Multiplexed address/data bit 11
PB_AD12	AJ34	B	Multiplexed address/data bit 12
PB_AD13	AJ33	B	Multiplexed address/data bit 13
PB_AD14	AJ32	B	Multiplexed address/data bit 14
PB_AD15	AJ31	B	PBI multiplexed address/data bit 15 (MSB). Used as multiplexed address and data bus for 16/16mux and 24/8 mux modes. Used as a data bus in 24/8 and 16/16 modes. AD(7:0) forms low-order byte of address in 24/8 mode.
PB_AD2	AK32	B	Multiplexed address/data bit 2
PB_AD3	AK31	B	Multiplexed address/data bit 3
PB_AD4	AL34	B	Multiplexed address/data bit 4
PB_AD5	AL33	B	Multiplexed address/data bit 5
PB_AD6	AL32	B	Multiplexed address/data bit 6
PB_AD7	AL31	B	Multiplexed address/data bit 7
PB_AD8	AH34	B	Multiplexed address/data bit 8
PB_AD9	AH33	B	Multiplexed address/data bit 9
PB_ALE	AG30	O	Address latch enable
PB_CS0#	AG34	O	Chip select #0 (active low)
PB_CS1#	AG33	O	Chip select #1 (active low)
PB_CS2#	AG32	O	Chip select #2 (active low)
PB_CS3#	AG31	O	Chip select #3 (active low). Pins PB_CSB3:0 become active for accesses to specified regions of the PB memory space.
PB_DIR#	AH30	O	Transfer direction (low = read, high = write)
PB_DMACK#	AM33	O	DMA acknowledge
PB_DMARQ	AN33	I	DMA request
PB_IORDY	AP33	I	Device ready. A device can extend a transfer cycle by pulling this line low prior to the IORDY sampling point, and holding it low until the device is ready to complete the cycle.
PB_RD#	AM34	O	Read command (active low)
PB_WR#	AN34	O	Write command (active low)

■ HOST INTERFACE

• IDE/ATAPI-6 Interface

● Block Diagram

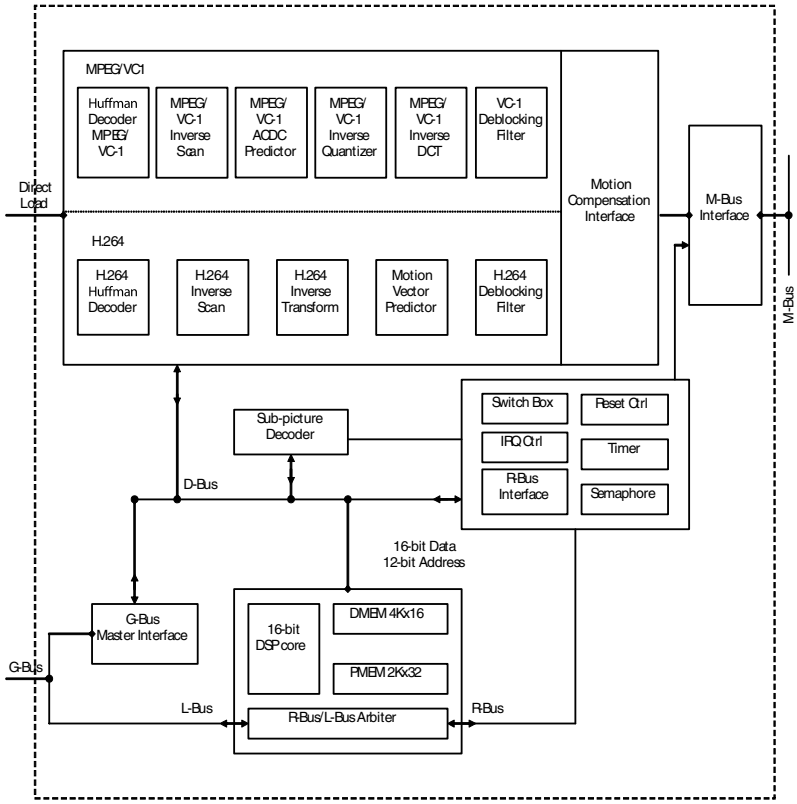


● Pin Function

Pin Name	Ball ID	Direction	Description
IDE_CS0#	D22	O	Chip select #0
IDE_CS1#	E22	O	Chip select #1
IDE_DACK#	C20	O	DMA acknowledge
IDE_DMARQ	D20	I	DMA request
IDE_A0	B21	O	IDE bus address bit 0
IDE_A1	E21	O	IDE bus address bit 1
IDE_A2	C21	O	IDE bus address bit 2
IDE_D0	C19	B	IDE data bit 0 (LSB)
IDE_D1	A19	B	IDE data bit 1
IDE_D10	B17	B	IDE data bit 10
IDE_D11	D18	B	IDE data bit 11
IDE_D12	A18	B	IDE data bit 12
IDE_D13	C18	B	IDE data bit 13
IDE_D14	E19	B	IDE data bit 14
IDE_D15	B19	B	IDE data bit 15 (MSB)
IDE_D2	D19	B	IDE data bit 2
IDE_D3	B18	B	IDE data bit 3
IDE_D4	E18	B	IDE data bit 4
IDE_D5	C17	B	IDE data bit 5
IDE_D6	A17	B	IDE data bit 6
IDE_D7	D17	B	IDE data bit 7
IDE_D8	C16	B	IDE data bit 8
IDE_D9	E17	B	IDE data bit 9
IDE_IOR#	A20	O	Read command (active-low)
IDE_IOW#	E20	O	Write command (active-low)
IDE_INTRQ	D21	I	IDE device interrupt request
IDE_IORDY	B20	I	IDE cycle extension input
IDE_NPCBLID	A21	I	Cable ID input. Used to detect the type of cable assembly in use.

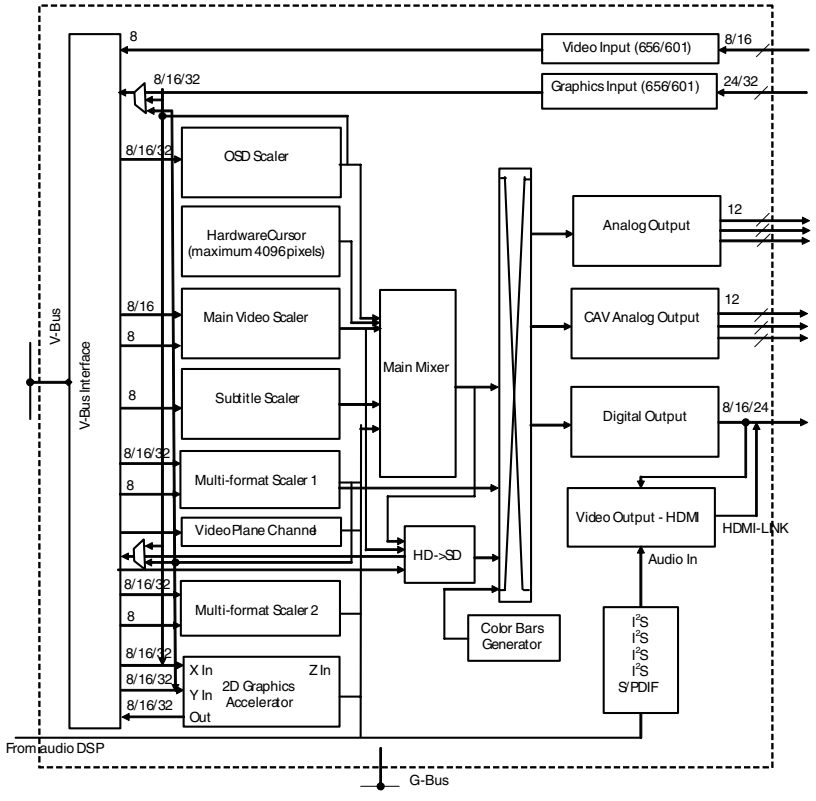
■ VIDEO DECODER SUBSYSTEM

● Block Diagram



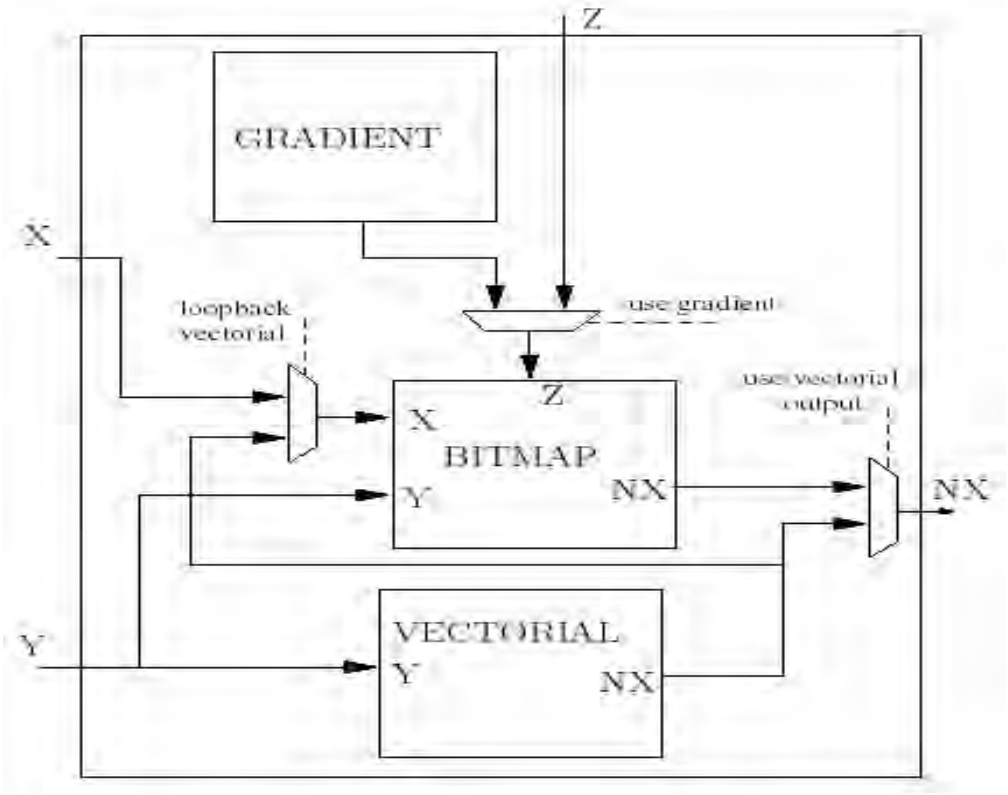
■ VIDEO PROCESSING SUBSYSTEM

● Block Diagram



■ VIDEO PROCESSING SUBSYSTEM
• Graphics Accelerator

● Block Diagram



■ VIDEO PROCESSING SUBSYSTEM
• Digital Video Input 0 (Graphic Input)

● Pin Function

Pin Name	Ball ID	Direction	Description
VI0_CLK	K1	I	Video graphic input port 0 clock
VI0_HS	J2	B	Video graphic input port 0 Hsync
VI0_P0	D2	I	Video graphic input port 0 bit 0
VI0_P1	D1	I	Video graphic input port 0 bit 1
VI0_P10	G5	I	Video graphic input port 0 bit 10
VI0_P11	G4	I	Video graphic input port 0 bit 11
VI0_P12	G3	I	Video graphic input port 0 bit 12
VI0_P13	G2	I	Video graphic input port 0 bit 13
VI0_P14	G1	I	Video graphic input port 0 bit 14
VI0_P15	H5	I	Video graphic input port 0 bit 15
VI0_P16	H4	I	Video graphic input port 0 bit 16
VI0_P17	H3	I	Video graphic input port 0 bit 17
VI0_P18	H2	I	Video graphic input port 0 bit 18
VI0_P19	H1	I	Video graphic input port 0 bit 19
VI0_P2	E3	I	Video graphic input port 0 bit 2
VI0_P20	J5	I	Video graphic input port 0 bit 20
VI0_P21	J4	I	Video graphic input port 0 bit 21

Pin Name	Ball ID	Direction	Description
VI0_P22	J3	I	Video graphic input port 0 bit 22
VI0_P23	K5	I	Video graphic input port 0 bit 23
VI0_P24	K4	I	Video graphic input port 0 bit 24
VI0_P25	K3	I	Video graphic input port 0 bit 25
VI0_P26	L5	I	Video graphic input port 0 bit 26
VI0_P27	L4	I	Video graphic input port 0 bit 27
VI0_P28	L3	I	Video graphic input port 0 bit 28
VI0_P29	M5	I	Video graphic input port 0 bit 29
VI0_P3	E2	I	Video graphic input port 0 bit 3
VI0_P30	M4	I	Video graphic input port 0 bit 30
VI0_P31	M3	I	Video graphic input port 0 bit 31
VI0_P4	E1	I	Video graphic input port 0 bit 4
VI0_P5	F5	I	Video graphic input port 0 bit 5
VI0_P6	F4	I	Video graphic input port 0 bit 6
VI0_P7	F3	I	Video graphic input port 0 bit 7
VI0_P8	F2	I	Video graphic input port 0 bit 8
VI0_P9	F1	I	Video graphic input port 0 bit 9
VI0_VLD	K2	I	Video graphic input port 0 data valid
VI0_VS	J1	B	Video graphic input port 0 Vsync

■ VIDEO PROCESSING SUBSYSTEM

• Digital Video Input 1

● Pin Function

Pin Name	Ball ID	Direction	Description
VI1_CLK	A3	I	Video input port 1 clock signal. Active edge programmable.
VI1_HS	B3	B	Video input port 1 Hsync input or output
VI1_P0	A2	I	Video input port 1 pixel bus bit 0
VI1_P1	B2	I	Video input port 1 pixel bus bit 1
VI1_P2	C3	I	Video input port 1 pixel bus bit 2
VI1_P3	C4	I	Video input port 1 pixel bus bit 3
VI1_P4	B1	I	Video input port 1 pixel bus bit 4
VI1_P5	C1	I	Video input port 1 pixel bus bit 5
VI1_P6	C2	I	Video input port 1 pixel bus bit 6
VI1_P7	D3	I	Video input port 1 pixel bus bit 7
VI1_VLD	B4	I	Video input port 1 data valid
VI1_VS	A4	B	Video input port 1 Vsync input or output

■ VIDEO PROCESSING SUBSYSTEM
• Digital Video Input 2

● Pin Function

Pin Name	Ball ID	Direction	Description
VI2_CLK	M1	I	Video input port 2 clock signal. Active edge programmable.
VI2_HS	L2	B	Video input port 2 Hsync input or output
VI2_VLD	M2	I	Video input port 2 data valid
VI2_VS	L1	B	Video input port 2 Vsync input or output

■ VIDEO PROCESSING SUBSYSTEM
• Digital Video Output

● Pin Function

Pin Name	Ball ID	Direction	Description
VO0_CLK	U1	O	Video output pixel clock signal
VO0_HS	V1	B	Video output Hsync input or output. Polarity programmable.
VO0_P0	W3	O	Video output pixel bus bit 0 (YPbPr/RGB)
VO0_P1	V4	O	Video output pixel bus bit 1 (YPbPr/RGB)
VO0_P10	R4	O	Video output pixel bus bit 10 (YPbPr/RGB)
VO0_P11	R3	O	Video output pixel bus bit 11 (YPbPr/RGB)
VO0_P12	R2	O	Video output pixel bus bit 12 (YPbPr/RGB)
VO0_P13	R1	O	Video output pixel bus bit 13 (YPbPr/RGB)
VO0_P14	P5	O	Video output pixel bus bit 14 (YPbPr/RGB)
VO0_P15	P4	O	Video output pixel bus bit 15 (YPbPr/RGB)
VO0_P16	P3	O	Video output pixel bus bit 16 (YPbPr/RGB)
VO0_P17	P2	O	Video output pixel bus bit 17 (YPbPr/RGB)
VO0_P18	P1	O	Video output pixel bus bit 18 (YPbPr/RGB)
VO0_P19	N5	O	Video output pixel bus bit 19 (YPbPr/RGB)
VO0_P2	V3	O	Video output pixel bus bit 2 (YPbPr/RGB)
VO0_P20	N4	O	Video output pixel bus bit 20 (YPbPr/RGB)
VO0_P21	N3	O	Video output pixel bus bit 21 (YPbPr/RGB)
VO0_P22	N2	O	Video output pixel bus bit 22 (YPbPr/RGB)
VO0_P23	N1	O	Video output pixel bus bit 23 (YPbPr/RGB)
VO0_P3	U4	O	Video output pixel bus bit 3 (YPbPr/RGB)
VO0_P4	U3	O	Video output pixel bus bit 4 (YPbPr/RGB)
VO0_P5	T4	O	Video output pixel bus bit 5 (YPbPr/RGB)
VO0_P6	T3	O	Video output pixel bus bit 6 (YPbPr/RGB)
VO0_P7	T2	O	Video output pixel bus bit 7 (YPbPr/RGB)
VO0_P8	T1	O	Video output pixel bus bit 8 (YPbPr/RGB)
VO0_P9	R5	O	Video output pixel bus bit 9 (YPbPr/RGB)
VO0_VLD	U2	O	Video output port data valid signal. Active high.
VO0_VS	V2	B	Video output port Vsync input or output. Polarity programmable.

■ VIDEO PROCESSING SUBSYSTEM
• Composite and S-Video

● Pin Function

Pin Name	Ball ID	Direction	Description
VO1_AVDD	AG4	I	Video output analog block 3.3V power supply connection
VO1_AVDD_U	AJ2	I	Pb-channel DAC power supply. Connect to a 3.3V nominal supply.
VO1_AVDD_V	AH2	I	Pr-channel DAC power supply. Connect to a 3.3V nominal supply.
VO1_AVDD_Y	AG2	I	Y-channel DAC power supply. Connect to a 3.3V nominal supply.
VO1_AVSS	AG5	I	Video output analog block ground connection
VO1_AVSS_U	AJ3	I	Pb-channel DAC ground connection
VO1_AVSS_V	AH3	I	Pr-channel DAC ground connection
VO1_AVSS_Y	AG3	I	Y-channel DAC ground connection
VO1_RSET	AH4	O	DAC current set pin. A resistor (140 ohm, 1% tolerance) connected between this pin and the ground sets the full-scale DAC current.
VO1_U	AJ1	O	Analog video output. Outputs Pb signal in the component YPbPr mode, the composite signal in S-video mode, or B signal in component RGB mode. Current output, intended to drive 75 ohm doubly-terminated load.
VO1_V	AH1	O	Analog video output. Outputs Pr signal in component YPbPr mode, C (chrominance) signal in S-video mode, or R signal in component RGB mode. Current output, intended to drive 75 ohm doubly-terminated load.
VO1_VREF	AH5	B	Video DAC current source reference voltage (1.25V nominal)
VO1_Y	AG1	O	Analog video output. Output Y (luminance) signals in the component YPbPr or S-video mode, or G signal in the component RGB mode. Current output, intended to drive 75 ohm doubly-terminated load.

■ VIDEO PROCESSING SUBSYSTEM
• Component Analog Output

● Pin Function

Pin Name	Ball ID	Direction	Description
VO2_AVDD	AK4	I	Video output analog block 3.3V power supply connection.
VO2_AVDD_U	AM2	I	Pb-channel DAC power supply. Connect to a 3.3V nominal supply.
VO2_AVDD_V	AL2	I	Pr-channel DAC power supply. Connect to a 3.3V nominal supply.
VO2_AVDD_Y	AK2	I	Y-channel DAC power supply. Connect to a 3.3V nominal supply.
VO2_AVSS	AK5	I	Video output analog block ground connection
VO2_AVSS_U	AM3	I	Pb-channel DAC ground connection
VO2_AVSS_V	AL3	I	Pr-channel DAC ground connection
VO2_AVSS_Y	AK3	I	Y-channel DAC ground connection
VO2_RSET	AJ4	O	DAC current set pin. A resistor (140 ohm, 1% tolerance) connected between this pin and the ground sets the full-scale DAC current.

Pin Name	Ball ID	Direction	Description
VO2_U	AM1	O	Analog video output. Outputs Pb signal in component YPbPr mode, or B signal in component the RGB mode. Current output, intended to drive 75 ohm doubly-terminated load.
VO2_V	AL1	O	Analog video output. Outputs Pr signal in component YPbPr mode, or R signal in the component RGB mode. Current output, intended to drive 75 ohm doubly-terminated load.
VO2_VREF	AJ5	B	Video DAC current source reference voltage (1.25V nominal)
VO2_Y	AK1	O	Analog video output. Outputs Y (luminance) signal in component YPbPr mode, or G signal in the component RGB mode. Current output, intended to drive 75 ohm doubly-terminated load.

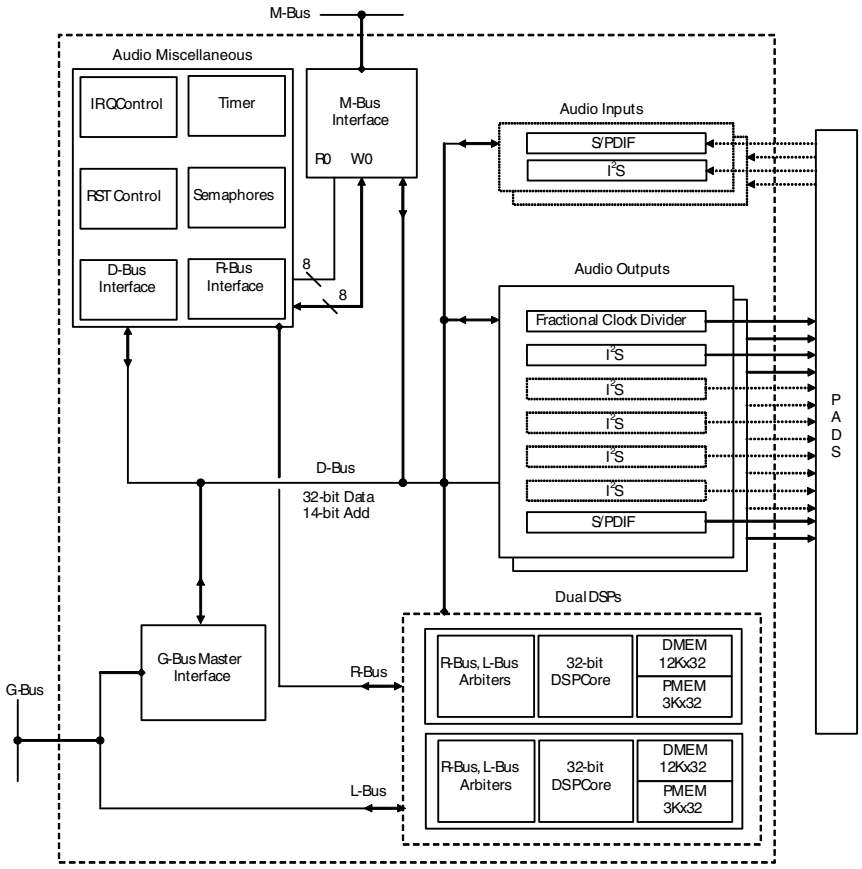
■ VIDEO PROCESSING SUBSYSTEM
• HDMI

● Pin Function

Pin Name	Ball ID	Direction	Description
HDMI_DSCL	U5	B	HDMI DDC clock
HDMI_DSDA	V5	B	HDMI DDC data (open drain output)
HDMI_HPD	W4	I	HDMI hot plug detect input
HDMI_MSEN	W5	I	HDMI monitor sense
HDMI_PD#	T5	O	HDMI power down (active low)
VO0_P0	W3	O	Bit 0 (LSB) of double-data rate bus to external HDMI PHY device
VO0_P1	V4	O	Bit 1 of double-data rate bus to external HDMI PHY device
VO0_P2	V3	O	Bit 2 of double-data rate bus to external HDMI PHY device
VO0_P3	U4	O	Bit 3 of double-data rate bus to external HDMI PHY device
VO0_P4	U3	O	Bit 4 of double-data rate bus to external HDMI PHY device
VO0_P5	T4	O	Bit 5 of double-data rate bus to external HDMI PHY device
VO0_P6	T3	O	Bit 6 of double-data rate bus to external HDMI PHY device
VO0_P7	T2	O	Bit 0 of double-data rate bus to external HDMI PHY device
VO0_P8	T1	O	Bit 8 of double-data rate bus to external HDMI PHY device
VO0_P9	R5	O	Bit 9 of double-data rate bus to external HDMI PHY device
VO0_P10	R4	O	Bit 10 of double-data rate bus to external HDMI PHY device
VO0_P11	R3	O	Bit 11 (MSB) of double-data rate bus to external HDMI PHY device
VO0_P12	R2	O	`CTL2´signal to external HDMI PHY device
VO0_P13	R1	O	`CTL3´signal to external HDMI PHY device

■ AUDIO PROCESSING SUBSYSTEM

● Block Diagram



■ AUDIO PROCESSING SUBSYSTEM

• Audio Input Interface

● Pin Function

Pin Name	Ball ID	Direction	Description
SI0_BCLK	AN7	I	Audio input 0 serial bit clock = LRCLKx32 / 64. Maximum frequency is 12.288MHz.
SI0_DATA	AP7	I	Audio input 0 serial data
SI0_LRCLK	AL7	I	Audio input 0 serial left/right clock
SI0_SPDIF	AM7	I	Audio input 0 serial data S/PDIF
SI1_BCLK	AL8	I	Audio input 1 serial bit clock = LRCLKx32 / 64. Maximum frequency is 12.288MHz.
SI1_DATA	AM8	I	Audio input 1 serial data
SI1_LRCLK	AK7	I	Audio input 1 serial left/right clock
SI1_SPDIF	AK8	I	Audio input 1 serial data S/PDIF

■ AUDIO PROCESSING SUBSYSTEM

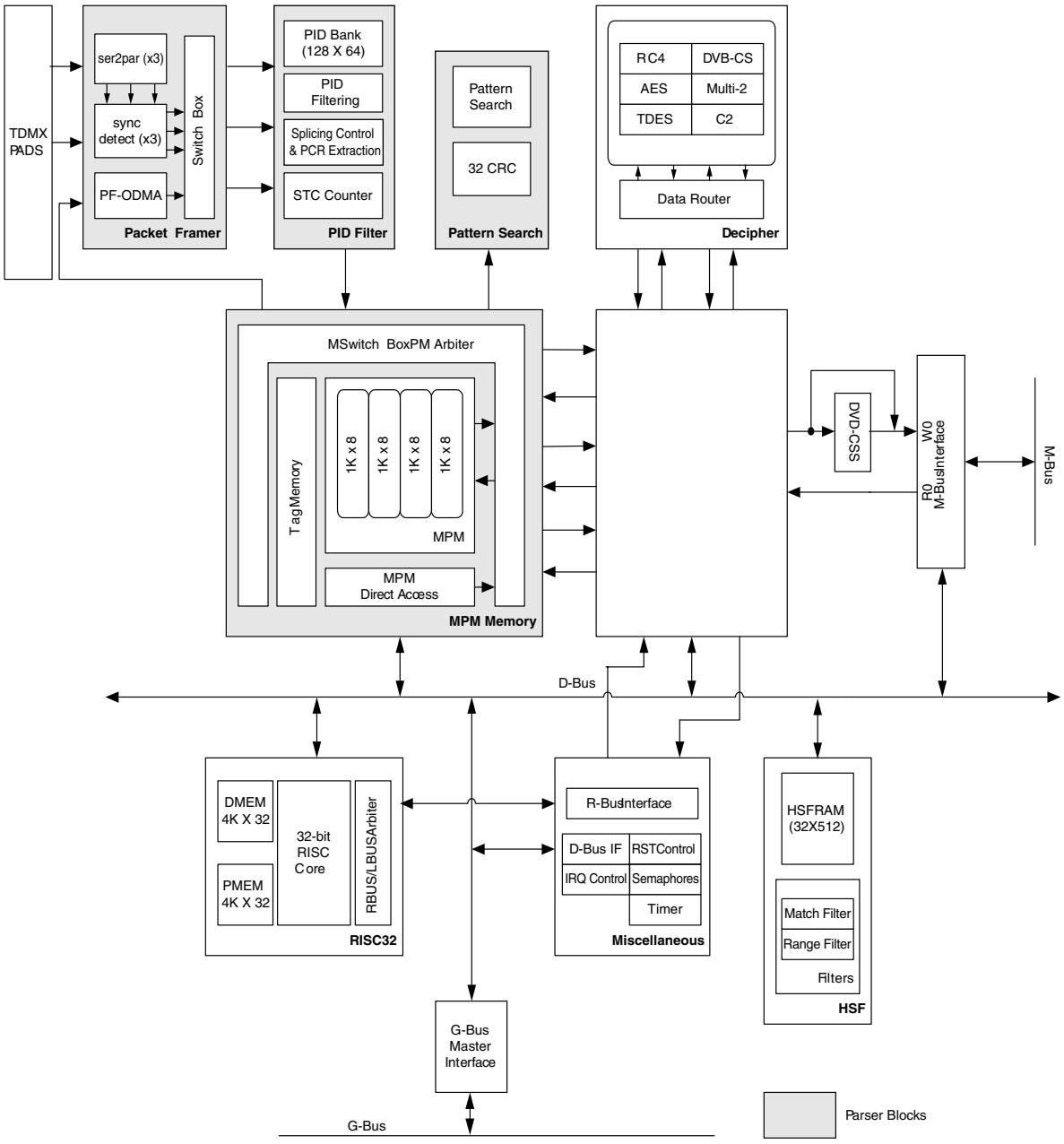
• Audio Output Interface

● Pin Function

Pin Name	Ball ID	Direction	Description
SO0_BCLK	AP3	O	Audio output 0 I^2S audio bit clock output. Maximum frequency is 12.288MHz.
SO0_DATA1	AP4	O	Audio output 0 I^2S channel 1 audio data output
SO0_DATA2	AN3	O	Audio output 0 I^2S channel 2 audio data output
SO0_DATA3	AN4	O	Audio output 0 I^2S channel 3 audio data output
SO0_DATA4	AM4	O	Audio output 0 I^2S channel 4 audio data output
SO0_DATA5	AL4	O	Audio output 0 I^2S channel 5 audio data output
SO0_LRCLK	AN2	O	Audio output 0 I^2S audio frame clock output
SO0_MACLK	AP2	O	Audio output 0 audio clock generator master clock output. Maximum frequency is 50MHz.
SO0_SPDIF	AN1	O	Audio output 0 S/PDIF audio data output
SO1_BCLK	AN5	O	Audio output 1 I^2S audio bit clock output. Maximum frequency is 12.288MHz.
SO1_DATA1	AP6	O	Audio output 1 I^2S channel 1 audio data output
SO1_DATA2	AM6	O	Audio output 1 I^2S channel 2 audio data output
SO1_DATA3	AN6	O	Audio output 1 I^2S channel 3 audio data output
SO1_DATA4	AL6	O	Audio output 1 I^2S channel 4 audio data output
SO1_DATA5	AL5	O	Audio output 1 I^2S channel 5 audio data output
SO1_LRCLK	AK6	O	Audio output 1 I^2S audio frame clock output
SO1_MACLK	AP5	O	Audio output 1 audio clock generator master clock output. Maximum frequency is 50MHz.
SO1_SPDIF	AM5	O	Audio output 1 S/PDIF audio data output

TRANSPORT DEMULTIPLEXER

Block Diagram



TRANSPORT DEMULTIPLEXER

- **SPI Transport Stream Interface**

Pin Function

Pin Name	Ball ID	Direction	Description
TDMX_GPIO0	AB30	B	Transport demultiplexer GPIO 0
TDMX_GPIO1	AB31	B	Transport demultiplexer GPIO 1
TS0_CLK	AF34	I	SPI port clock input data is transferred on the positive-going edge of this clock. When the port is operated in the SSI mode, this pin is not used.
TS0_IN_D0	AE33	I	SPI input data bit 0 (LSB). When the port is operated in the SSI mode, this pin is the SSI0_DATA input.

Pin Name	Ball ID	Direction	Description
TS0_IN_D1	AF33	I	SPI input data bit 1. When the port is operated in the SSI mode, this pin is the SSI0_CLK input.
TS0_IN_D2	AE32	I	SPI input data bit 2. When the port is operated in the SSI mode, this pin is the SSI0_SYNC input.
TS0_IN_D3	AF32	I	SPI input data bit 3. When the port is operated in the SSI mode, this pin is the SSI0_VLD input.
TS0_IN_D4	AE31	I	SPI input data bit 4. When the port is operated in the SSI mode, this pin is the SSI1_DATA input.
TS0_IN_D5	AF31	I	SPI input data bit 5. When the port is operated in the SSI mode, this pin is the SSI1_CLK input.
TS0_IN_D6	AE30	I	SPI input data bit 6. When the port is operated in the SSI mode, this pin is the SSI1_SYNC input.
TS0_IN_D7	AF30	I	SPI input data bit 7 (MSB). When the port is operated in the SSI mode, this pin is the SSI1_VLD input.
TS0_IN_SYNC	AE34	I	SPI sync (selectable polarity, active high/low). Identifies the first byte of a packet. When the port is operated in the SSI mode, this pin is not used.
TS0_IN_VLD	AD30	I	SPI data valid (active high). Indicates valid transport packet bytes. When the port is operated in the SSI mode, this pin is not used.
TS1_CLK	AC34	I	SPI port clock input data is transferred on the positive-going edge of this clock. When the port is operated in the SSI mode, this pin is not used.
TS1_IN_D0	AD34	I	SPI input data bit 0 (LSB). When the port is operated in the SSI mode, this pin is the SSI2_DATA input.
TS1_IN_D1	AB33	I	SPI input data bit 1. When the port is operated in the SSI mode, this pin is the SSI2_CLK input.
TS1_IN_D2	AC33	I	SPI input data bit 2. When the port is operated in the SSI mode, this pin is the SSI2_SYNC input.
TS1_IN_D3	AD33	I	SPI input data bit 3. When the port is operated in the SSI mode, this pin is the SSI2_VLD input.
TS1_IN_D4	AC32	I	SPI input data bit 4.
TS1_IN_D5	AD32	I	SPI input data bit 5.
TS1_IN_D6	AC31	I	SPI input data bit 6.
TS1_IN_D7	AD31	I	SPI input data bit 7 (MSB).
TS1_IN_SYNC	AB32	I	SPI sync (selectable polarity, active high/low). Identifies the first byte of a packet. When the port is operated in the SSI mode, this pin is not used.
TS1_IN_VLD	AC30	I	SPI data valid (active high). Indicates valid transport packet bytes. When the port is operated in the SSI mode, this pin is not used.

■ SHARED PINS

• Uart

● Pin Function

Pin Name	Ball ID	Direction	Description	Alternate Function	Alternate Function
UART1_RX	A12	B	UART 1 receive data input	EJ_TDI. Test data input (TDI) for the EJTAG TAP.	GPIO0
UART1_CTS	C12	B	UART 1 clear to send. Flow control signal.	EJ_TMS. Test mode select input (TMS) for the EJTAG TAP.	GPIO1

Pin Name	Ball ID	Direction	Description	Alternate Function	Alternate Function
UART1_DSR	B11	B	UART 1 data set ready. Data set status signal.	EJ_TRST_N. Active-low Test Reset Input (TRST) for the EJTAG TAP. At power-up, the assertion of EJ_TRST_N causes the TAP controller to be reset.	GPIO2
UART1_DCD	C11	B	UART 1 data carrier detect. Data set status signal.	EJ_TCK. Test clock input (TCK) for the EJTAG TAP.	GPIO3
UART1_TX	A11	B	UART 1 transmit data output		GPIO4
UART1_RTS	B10	B	UART 1 request to send. Flow control signal.	EJ_TDO. Test data output (TDO) for the EJTAG TAP.	GPIO5
UART1_DTR	C10	B	UART 1 data terminal ready. Data terminal status signal.		GPIO6
UART0_RX	A14	B	UART 0 receive data input		GPIO0
UART0_CTS	B14	B	UART 0 clear to send. Flow control signal.		GPIO1
UART0_DSR	C14	B	UART 0 data set ready. Data set status signal.		GPIO2
UART0_DCD	B12	B	UART 0 data carrier detect. Data set status signal.		GPIO3
UART0_TX	A13	B	UART 0 transmit data output		GPIO4
UART0_RTS	B13	B	UART 0 request to send. Flow control signal.		GPIO5
UART0_DTR	C13	B	UART 0 data terminal ready. Data terminal status signal.		GPIO6

■ SHARED PINS
•GPIO

● Pin Function

Pin Name	Ball ID	Direction	Alternate Function
GPIO2	C5	B	FIP serial data input
GPIO3	D5	B	FIP serial data output
GPIO4	D4	B	FIP data strobe
GPIO5	E4	B	FIP serial I/O clock
GPIO12	B7	B	Infrared decoder. Default pin assigned to the IR decoder input function (may be mapped to any other GPIO pin under the software control).
GPIO0	A5	B	I2CM_SCL. I^2C master interface serial clock.
GPIO1	B5	B	I2CM_SDA. I^2C master interface serial data.
GPIO6	E5	B	I2CS_SCL. I^2C slave interface serial clock.
GPIO7	B6	B	I2CS_SDA. I^2C slave interface serial data.

■ SHARED PINS

• Ethernet

● Pin Function

Pin name	Ball ID	Direction	Alternate Function
GPIO0	AA1	B	ETH_TXCLK. Ethernet transmit clock.
GPIO1	AA2	B	ETH_TX_EN. Ethernet transmit enable.
GPIO2	Y3	B	ETH_TXD0. Ethernet transmit data 0.
GPIO3	Y2	B	ETH_TXD1. Ethernet transmit data 1.
GPIO4	Y1	B	ETH_TXD2. Ethernet transmit data 2.
GPIO5	W1	B	ETH_TXD3. Ethernet transmit data 3.
GPIO6	AC2	B	ETH_RXCLK. Ethernet receive clock.
GPIO7	AE1	B	ETH_RX_DV. Ethernet receive data valid.
GPIO8	AF1	B	ETH_RX_ER. Ethernet receive error.
GPIO9	AC1	B	ETH_RXD0. Ethernet receive data 0.
GPIO10	AB3	B	ETH_RXD1. Ethernet receive data 1.
GPIO11	AB2	B	ETH_RXD2. Ethernet receive data 2.
GPIO12	AB1	B	ETH_RXD3. Ethernet receive data 3.
GPIO13	AA3	B	ETH_CRS. Ethernet carrier sense.
GPIO14	AC3	B	ETH_COL. Ethernet collision detect.
GPIO15	AD1	B	ETH_MDC. Ethernet management data clock.
GPIO16	Y4	B	ETH_MDIO. Ethernet management data I/O.
GPIO17	AA5	B	ETH_MDINT#. Ethernet management interrupt.

■ MISCELLANEOUS PINS

• Miscellaneous

● Pin Function

Pin Name	Ball ID	Direction	Description
NC	A1	-	No connect
NC	A34	-	No connect
NC	AA4	-	No connect
NC	AK25	-	No connect
NC	W2	-	No connect
NC	W32	-	No connect
NC	W33	-	No connect
NC	W34	-	No connect
NC	Y5	-	No connect
NC	Y30	-	No connect
NC	Y31	-	No connect
NC	Y32	-	No connect
NC	Y33	-	No connect
NC	Y34	-	No connect
NC	AA30	-	No connect
NC	AA31	-	No connect

Pin Name	Ball ID	Direction	Description
NC	AA32	-	No connect
NC	AA33	-	No connect
NC	AA34	-	No connect
NC	AB34	-	No connect
NC	AK26	-	No connect
NC	AK27	-	No connect
NC	AK28	-	No connect
NC	AL26	-	No connect
NC	AM26	-	No connect
NC	AN26	-	No connect
NC	AP1	-	No connect
NC	AP26	-	No connect
NC	AP34	-	No connect
RESET#	A8	I	Device reset input. Active low.
RTC_TEST	W3	I	Used for manufacturing purposes only
TEST	E10	I	Test mode input. Tie to VSS for normal operation.
XTAL_DISC	E11	I	Used for manufacturing purposes only

■ LISTING OF GROUND PINS (VSS)

• Ground

● Pin Function

Pin Name	Ball ID	Direction	Description
VSS	F6	I	Ground. Zero volt reference for 1.2, 2.5 and 3.3V supplies
VSS	F8	I	Ground
VSS	F11	I	Ground
VSS	F12	I	Ground
VSS	F15	I	Ground
VSS	F16	I	Ground
VSS	F19	I	Ground
VSS	F20	I	Ground
VSS	F21	I	Ground
VSS	F24	I	Ground
VSS	F26	I	Ground
VSS	G7	I	Ground
VSS	G9	I	Ground
VSS	G10	I	Ground
VSS	G13	I	Ground
VSS	G14	I	Ground
VSS	G17	I	Ground
VSS	G18	I	Ground
VSS	G22	I	Ground
VSS	G25	I	Ground

Pin Name	Ball ID	Direction	Description
VSS	G26	I	Ground
VSS	G28	I	Ground
VSS	H6	I	Ground
VSS	J7	I	Ground
VSS	J28	I	Ground
VSS	J29	I	Ground
VSS	K7	I	Ground
VSS	K28	I	Ground
VSS	L6	I	Ground
VSS	M6	I	Ground
VSS	N7	I	Ground
VSS	N28	I	Ground
VSS	N29	I	Ground
VSS	P7	I	Ground
VSS	P14	I	Ground
VSS	P15	I	Ground
VSS	P16	I	Ground
VSS	P17	I	Ground
VSS	P18	I	Ground
VSS	P19	I	Ground
VSS	P20	I	Ground
VSS	P21	I	Ground
VSS	P28	I	Ground
VSS	R6	I	Ground
VSS	R14	I	Ground
VSS	R15	I	Ground
VSS	R16	I	Ground
VSS	R17	I	Ground
VSS	R18	I	Ground
VSS	R19	I	Ground
VSS	R20	I	Ground
VSS	R21	I	Ground
VSS	R29	I	Ground
VSS	T6	I	Ground
VSS	T14	I	Ground
VSS	T15	I	Ground
VSS	T16	I	Ground
VSS	T17	I	Ground
VSS	T18	I	Ground
VSS	T19	I	Ground
VSS	T20	I	Ground
VSS	T21	I	Ground
VSS	U7	I	Ground

Pin Name	Ball ID	Direction	Description
VSS	U14	I	Ground
VSS	U15	I	Ground
VSS	U16	I	Ground
VSS	U17	I	Ground
VSS	U18	I	Ground
VSS	U19	I	Ground
VSS	U20	I	Ground
VSS	U21	I	Ground
VSS	U28	I	Ground
VSS	V7	I	Ground
VSS	V14	I	Ground
VSS	V15	I	Ground
VSS	V16	I	Ground
VSS	V17	I	Ground
VSS	V18	I	Ground
VSS	V19	I	Ground
VSS	V20	I	Ground
VSS	V21	I	Ground
VSS	V28	I	Ground
VSS	V29	I	Ground
VSS	W6	I	Ground
VSS	W14	I	Ground
VSS	W15	I	Ground
VSS	W16	I	Ground
VSS	W17	I	Ground
VSS	W18	I	Ground
VSS	W19	I	Ground
VSS	W20	I	Ground
VSS	W21	I	Ground
VSS	W29	I	Ground
VSS	Y6	I	Ground
VSS	Y14	I	Ground
VSS	Y15	I	Ground
VSS	Y16	I	Ground
VSS	Y17	I	Ground
VSS	Y18	I	Ground
VSS	Y19	I	Ground
VSS	Y20	I	Ground
VSS	Y21	I	Ground
VSS	Y29	I	Ground
VSS	AA7	I	Ground
VSS	AA14	I	Ground
VSS	AA15	I	Ground

Pin Name	Ball ID	Direction	Description
VSS	AA16	I	Ground
VSS	AA17	I	Ground
VSS	AA18	I	Ground
VSS	AA19	I	Ground
VSS	AA20	I	Ground
VSS	AA21	I	Ground
VSS	AA28	I	Ground
VSS	AB7	I	Ground
VSS	AB28	I	Ground
VSS	AC6	I	Ground
VSS	AC29	I	Ground
VSS	AD6	I	Ground
VSS	AD29	I	Ground
VSS	AE7	I	Ground
VSS	AE28	I	Ground
VSS	AF7	I	Ground
VSS	AF28	I	Ground
VSS	AG6	I	Ground
VSS	AG29	I	Ground
VSS	AH6	I	Ground
VSS	AH7	I	Ground
VSS	AH9	I	Ground
VSS	AH10	I	Ground
VSS	AH13	I	Ground
VSS	AH14	I	Ground
VSS	AH17	I	Ground
VSS	AH18	I	Ground
VSS	AH21	I	Ground
VSS	AH22	I	Ground
VSS	AH25	I	Ground
VSS	AH26	I	Ground
VSS	AH28	I	Ground
VSS	AJ6	I	Ground
VSS	AJ7	I	Ground
VSS	AJ8	I	Ground
VSS	AJ11	I	Ground
VSS	AJ12	I	Ground
VSS	AJ15	I	Ground
VSS	AJ16	I	Ground
VSS	AJ19	I	Ground
VSS	AJ20	I	Ground
VSS	AJ23	I	Ground
VSS	AJ24	I	Ground

Pin Name	Ball ID	Direction	Description
VSS	AJ27	I	Ground
VSS	AJ29	I	Ground
VSS_PLL3	E12	I	Ground. Dedicated connection for PLL#3
VSS_PLL2	E13	I	Ground. Dedicated connection for PLL#2
VSS_PLL1	E14	I	Ground. Dedicated connection for PLL#1
VSS_PLL0	E15	I	Ground. Dedicated connection for PLL#0

■ VOLT POWER RAIL

• 1.2V Power Rail (VDD_1V2)

● Pin Function

Pin Name	Ball ID	Direction	Description
VDD_1V2	G8	I	1.2V (nominal) power supply
VDD_1V2	G11	I	1.2V (nominal) power supply
VDD_1V2	G12	I	1.2V (nominal) power supply
VDD_1V2	G15	I	1.2V (nominal) power supply
VDD_1V2	G16	I	1.2V (nominal) power supply
VDD_1V2	G19	I	1.2V (nominal) power supply
VDD_1V2	G20	I	1.2V (nominal) power supply
VDD_1V2	G21	I	1.2V (nominal) power supply
VDD_1V2	G23	I	1.2V (nominal) power supply
VDD_1V2	G24	I	1.2V (nominal) power supply
VDD_1V2	G27	I	1.2V (nominal) power supply
VDD_1V2	H7	I	1.2V (nominal) power supply
VDD_1V2	H28	I	1.2V (nominal) power supply
VDD_1V2	L7	I	1.2V (nominal) power supply
VDD_1V2	L28	I	1.2V (nominal) power supply
VDD_1V2	M7	I	1.2V (nominal) power supply
VDD_1V2	M28	I	1.2V (nominal) power supply
VDD_1V2	R7	I	1.2V (nominal) power supply
VDD_1V2	R28	I	1.2V (nominal) power supply
VDD_1V2	T7	I	1.2V (nominal) power supply
VDD_1V2	T28	I	1.2V (nominal) power supply
VDD_1V2	W7	I	1.2V (nominal) power supply
VDD_1V2	W28	I	1.2V (nominal) power supply
VDD_1V2	Y7	I	1.2V (nominal) power supply
VDD_1V2	Y28	I	1.2V (nominal) power supply
VDD_1V2	AC7	I	1.2V (nominal) power supply
VDD_1V2	AC28	I	1.2V (nominal) power supply
VDD_1V2	AD7	I	1.2V (nominal) power supply
VDD_1V2	AD28	I	1.2V (nominal) power supply
VDD_1V2	AG7	I	1.2V (nominal) power supply
VDD_1V2	AG28	I	1.2V (nominal) power supply

Pin Name	Ball ID	Direction	Description
VDD_1V2	AH8	I	1.2V (nominal) power supply
VDD_1V2	AH11	I	1.2V (nominal) power supply
VDD_1V2	AH12	I	1.2V (nominal) power supply
VDD_1V2	AH15	I	1.2V (nominal) power supply
VDD_1V2	AH16	I	1.2V (nominal) power supply
VDD_1V2	AH19	I	1.2V (nominal) power supply
VDD_1V2	AH20	I	1.2V (nominal) power supply
VDD_1V2	AH23	I	1.2V (nominal) power supply
VDD_1V2	AH24	I	1.2V (nominal) power supply
VDD_1V2	AH27	I	1.2V (nominal) power supply
VDD_PLL0_1V2	D12	I	1.2V (nominal) power supply. Dedicated power connection for PLL#0.

■ VOLT POWER RAIL
• 2.5V Power Rail (VDD_2V5)

● Pin Function

Pin Name	Ball ID	Direction	Description
VDD_2V5	F22	I	2.5/2.6V (nominal) power supply
VDD_2V5	F23	I	2.5/2.6V (nominal) power supply
VDD_2V5	F25	I	2.5/2.6V (nominal) power supply
VDD_2V5	F27	I	2.5/2.6V (nominal) power supply
VDD_2V5	F29	I	2.5/2.6V (nominal) power supply
VDD_2V5	H29	I	2.5/2.6V (nominal) power supply
VDD_2V5	K29	I	2.5/2.6V (nominal) power supply
VDD_2V5	M29	I	2.5/2.6V (nominal) power supply
VDD_2V5	P29	I	2.5/2.6V (nominal) power supply
VDD_2V5	T29	I	2.5/2.6V (nominal) power supply
VDD_2V5	U29	I	2.5/2.6V (nominal) power supply

■ VOLT POWER RAIL
• 3.3V Power Rail (VDD_3V3)

● Pin Function

Pin Name	Ball ID	Direction	Description
VDD_3V3	F7	I	3.3V (nominal) power supply
VDD_3V3	F9	I	3.3V (nominal) power supply
VDD_3V3	F10	I	3.3V (nominal) power supply
VDD_3V3	F13	I	3.3V (nominal) power supply
VDD_3V3	F14	I	3.3V (nominal) power supply
VDD_3V3	F17	I	3.3V (nominal) power supply
VDD_3V3	F18	I	3.3V (nominal) power supply
VDD_3V3	G6	I	3.3V (nominal) power supply

Pin Name	Ball ID	Direction	Description
VDD_3V3	J6	I	3.3V (nominal) power supply
VDD_3V3	K6	I	3.3V (nominal) power supply
VDD_3V3	N6	I	3.3V (nominal) power supply
VDD_3V3	P6	I	3.3V (nominal) power supply
VDD_3V3	U6	I	3.3V (nominal) power supply
VDD_3V3	V6	I	3.3V (nominal) power supply
VDD_3V3	AA6	I	3.3V (nominal) power supply
VDD_3V3	AA29	I	3.3V (nominal) power supply
VDD_3V3	AB6	I	3.3V (nominal) power supply
VDD_3V3	AB29	I	3.3V (nominal) power supply
VDD_3V3	AE6	I	3.3V (nominal) power supply
VDD_3V3	AE29	I	3.3V (nominal) power supply
VDD_3V3	AF6	I	3.3V (nominal) power supply
VDD_3V3	AF29	I	3.3V (nominal) power supply
VDD_3V3	AH29	I	3.3V (nominal) power supply
VDD_3V3	AJ9	I	3.3V (nominal) power supply
VDD_3V3	AJ10	I	3.3V (nominal) power supply
VDD_3V3	AJ13	I	3.3V (nominal) power supply
VDD_3V3	AJ14	I	3.3V (nominal) power supply
VDD_3V3	AJ17	I	3.3V (nominal) power supply
VDD_3V3	AJ18	I	3.3V (nominal) power supply
VDD_3V3	AJ21	I	3.3V (nominal) power supply
VDD_3V3	AJ22	I	3.3V (nominal) power supply
VDD_3V3	AJ25	I	3.3V (nominal) power supply
VDD_3V3	AJ26	I	3.3V (nominal) power supply
VDD_3V3	AJ28	I	3.3V (nominal) power supply
VDD_PLL1_3V3	D13	I	3.3V (nominal) power supply Dedicated power connection for PLL#1.
VDD_PLL2_3V3	D14	I	3.3V (nominal) power supply. Dedicated power connection for PLL#2.
VDD_PLL3_3V3	D15	I	3.3V (nominal) power supply. Dedicated power connection for PLL#3.

■ PIN ARRANGEMENT

● Top Left Quadrant

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
A	NC	VI1_P0	VI1_CLK	VI1_VS	GPIO0	RCLK1_XTAL_OUT	RCLK1_XTAL_IN	RESET#	XTAL_OUT	XTAL_IN	UART1_TX	UART1_RX	UART0_TX	UART0_RX	SCARD_IO	SCARD_CLK	IDE_D6
B	VI1_P4	VI1_P1	VI1_HS	VI1_VLD	GPIO1	GPIO7	GPIO12	RCLK0_IN	XTAL_BUF	UART1_RTS	UART1_DSR	UART0_DCD	UART0_RTS	UART0_CTS	SCARD_RST	SCARD_FC#	IDE_D10
C	VI1_P5	VI1_P6	VI1_P2	VI1_P3	GPIO2	GPIO8	GPIO13	VCXO1_IN	VCXO0_IN	UART1_DTR	UART1_DCD	UART1_CTS	UART0_DTR	UART0_DSR	SCARD_CTL0	IDE_D8	IDE_D5
D	VI0_P1	VI0_P0	VI1_P7	GPIO4	GPIO3	GPIO9	GPIO14	RCLK0_OUT	RCLK1_OUT	RCLK2_OUT	T AG_UART#	VDD_PLL0_1V2	VDD_PLL1_3V3	VDD_PLL2_3V3	VDD_PLL3_3V3	SCARD_CTL1	IDE_D7
E	VI0_P4	VI0_P3	VI0_P2	GPIO5	GPIO6	GPIO10	GPIO15	GPIO11	RCLK3_OUT	TEST	XTAL_DISC	VSS_PLL0	VSS_PLL1	VSS_PLL2	VSS_PLL3	SCARD_CTL2	IDE_D9
F	VI0_P9	VI0_P8	VI0_P7	VI0_P6	VI0_P5	VSS	VDD_3V3	VSS	VDD_3V3	VDD_3V3	VSS	VSS	VDD_3V3	VDD_3V3	VSS	VSS	VDD_3V3
G	VI0_P14	VI0_P13	VI0_P12	VI0_P11	VI0_P10	VDD_3V3	VSS	VDD_1V2	VSS	VSS	VDD_1V2	VDD_1V2	VSS	VSS	VDD_1V2	VDD_1V2	VSS
H	VI0_P19	VI0_P18	VI0_P17	VI0_P16	VI0_P15	VSS	VDD_1V2										
	VI0_VS	VI0_HS	VI0_P22	VI0_P21	VI0_P20	VDD_3V3	VSS										
K	VI0_CLK	VI0_VLD	VI0_P25	VI0_P24	VI0_P23	VDD_3V3	VSS										
L	VI2_VS	VI2_HS	VI0_P28	VI0_P27	VI0_P26	VSS	VDD_1V2										
M	VI2_CLK	VI2_VLD	VI0_P31	VI0_P30	VI0_P29	VSS	VDD_1V2										
N	VO0_P23	VO0_P22	VO0_P21	VO0_P20	VO0_P19	VDD_3V3	VSS										
P	VO0_P18	VO0_P17	VO0_P16	VO0_P15	VO0_P14	VDD_3V3	VSS							VSS	VSS	VSS	VSS
R	VO0_P13	VO0_P12	VO0_P11	VO0_P10	VO0_P9	VSS	VDD_1V2							VSS	VSS	VSS	VSS
T	VO0_P8	VO0_P7	VO0_P6	VO0_P5	HDMI_PD#	VSS	VDD_1V2							VSS	VSS	VSS	VSS
U	VO0_CLK	VO0_VLD	VO0_P4	VO0_P3	HDMI_DSCL	VDD_3V3	VSS							VSS	VSS	VSS	VSS

● Top Right Quadrant

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
IDE_D12	IDE_D1	IDE_IOR#	IDE_NPCBLID	DRAM1_DQ13	DRAM1_DQ9	DRAM1_DQS0	DRAM1_DQ4	DRAM1_CK	DRAM1_CK#	DRAM1_DQ27	DRAM1_DM3	DRAM1_DQ21	DRAM1_DQ16	DRAM1_CAS#	DRAM1_BA0	NC	A
IDE_D3	IDE_D15	IDE_IORDY	IDE_A0	DRAM1_DQ14	DRAM1_DQ10	DRAM1_DM0	DRAM1_DQ5	DRAM1_DQ2	DRAM1_DQ31	DRAM1_DQ26	DRAM1_DM2	DRAM1_DQ20	DRAM1_A13	DRAM1_RAS#	DRAM1_BA1	DRAM1_A0	B
IDE_D13	IDE_D0	IDE_ACK#	IDE_A2	DRAM1_DQ15	DRAM1_DQ11	DRAM1_DM1	DRAM1_DQ6	DRAM1_DQ3	DRAM1_DQ30	DRAM1_DQ25	DRAM1_DQS2	DRAM1_DQ19	DRAM1_WE#	DRAM1_CS#	DRAM1_A10	DRAM1_A1	C
IDE_D11	IDE_D2	IDE_DMARQ	IDE_IRQ	IDE_CS0#	DRAM1_DQ12	DRAM1_DQ8	DRAM1_DQ7	DRAM1_DQ0	DRAM1_DQ28	DRAM1_DQS3	DRAM1_DQ22	DRAM1_DQ17	DRAM1_A9	DRAM1_A6	DRAM1_A4	DRAM1_A2	D
IDE_D4	IDE_D14	IDE_IOW#	IDE_A1	IDE_CS1#	DRAM1_VREFSSTL2	DRAM1_DQS1	DRAM1_VREFSSTL1	DRAM1_DQ1	DRAM1_DQ29	DRAM1_DQ24	DRAM1_DQ23	DRAM1_DQ18	DRAM1_A11	DRAM1_A7	DRAM1_A5	DRAM1_A3	E
VDD_3V3	VSS	VSS	VSS	VDD_2V5	VDD_2V5	VSS	VDD_2V5	VSS	VDD_2V5	DRAM1_VREFSSTL0	VDD_2V5	DRAM1_CKE	DRAM1_A12	DRAM1_A8	DRAM0_DQ15	DRAM0_DQ14	F
VSS	VDD_1V2	VDD_1V2	VDD_1V2	VSS	VDD_1V2	VDD_1V2	VSS	VSS	VDD_1V2	VSS	DRAM0_VREFSSTL2	DRAM0_DQ12	DRAM0_DQ13	DRAM0_DQ11	DRAM0_DQ10	DRAM0_DQ9	G
										VDD_1V2	VDD_2V5	DRAM0_DQS1	DRAM0_DQ8	DRAM0_DM1	DRAM0_DM0	DRAM0_DQS0	
										VSS	VSS	DRAM0_VREFSSTL1	DRAM0_DQ7	DRAM0_DQ6	DRAM0_DQ5	DRAM0_DQ4	
										VSS	VDD_2V5	DRAM0_DQ1	DRAM0_DQ0	DRAM0_DQ3	DRAM0_DQ2	DRAM0_CK	K
										VDD_1V2	DRAM0_VREFSSTL0	DRAM0_DQ29	DRAM0_DQ28	DRAM0_DQ30	DRAM0_DQ31	DRAM0_CK#	L
										VDD_1V2	VDD_2V5	DRAM0_DQ24	DRAM0_DQS3	DRAM0_DQ25	DRAM0_DQ26	DRAM0_DQ27	M
										VSS	VSS	DRAM0_DQ23	DRAM0_DQ22	DRAM0_DQS2	DRAM0_DM2	DRAM0_DM3	N
VSS	VSS	VSS	VSS							VSS	VDD_2V5	DRAM0_DQ18	DRAM0_DQ17	DRAM0_DQ19	DRAM0_DQ20	DRAM0_DQ21	P
VSS	VSS	VSS	VSS							VDD_1V2	VSS	DRAM0_CKE	DRAM0_A12	DRAM0_WE#	DRAM0_A13	DRAM0_DQ16	R
VSS	VSS	VSS	VSS							VDD_1V2	VDD_2V5	DRAM0_A11	DRAM0_A9	DRAM0_CS#	DRAM0_RAS#	DRAM0_CAS#	T
VSS	VSS	VSS	VSS							VSS	VDD_2V5	DRAM0_A8	DRAM0_A7	DRAM0_A10	DRAM0_BA1	DRAM0_BA0	

● Bottom Left Quadrant

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
V	VO0_HS	VO0_VS	VO0_P2	VO0_P1	HDMI_DSDA	VDD_3V3	VSS							VSS	VSS	VSS	VSS
W	ETH_TXD3	NC	VO0_P0	HDMI_HPD	HDMI_MSEN	VSS	VDD_1V2							VSS	VSS	VSS	VSS
Y	ETH_TXD2	ETH_TXD1	ETH_TXD0	ETH_MDIO	NC	VSS	VDD_1V2							VSS	VSS	VSS	VSS
AA	ETH_TXCLK	ETH_TX_EN	ETH_CRS	NC	ETH_MDINT#	VDD_3V3	VSS							VSS	VSS	VSS	VSS
AB	ETH_RXD3	ETH_RXD2	ETH_RXD1	GPIO31	GPIO30	VDD_3V3	VSS										
AC	ETH_RXD0	ETH_RXCLK	ETH_COL	GPIO29	GPIO28	VSS	VDD_1V2										
AD	ETH_MDC	GPIO27	GPIO26	GPIO25	GPIO24	VSS	VDD_1V2										
AE	ETH_RX_DV	GPIO23	GPIO22	GPIO21	GPIO20	VDD_3V3	VSS										
AF	ETH_RX_ER	GPIO19	GPIO18	GPIO17	GPIO16	VDD_3V3	VSS										
AG	VO1_Y	VO1_AVDD_Y	VO1_AVSS_Y	VO1_AVDD	VO1_AVSS	VSS	VDD_1V2										
AH	VO1_V	VO1_AVDD_V	VO1_AVSS_V	VO1_RSET	VO1_VREF	VSS	VSS	VDD_1V2	VSS	VSS	VDD_1V2	VDD_1V2	VSS	VSS	VDD_1V2	VDD_1V2	VSS
AJ	VO1_U	VO1_AVDD_U	VO1_AVSS_U	VO2_RSET	VO2_VREF	VSS	VSS	VSS	VDD_3V3	VDD_3V3	VSS	VSS	VDD_3V3	VDD_3V3	VSS	VSS	VDD_3V3
AK	VO2_Y	VO2_AVDD_Y	VO2_AVSS_Y	VO2_AVDD	VO2_AVSS	SO1_LRCLK	SI1_LRCLK	SI1_SPDIF	PCI_REQ1#	PCI_REQ2#	PCI_REQ3#	PCI_IDSEL2	PCI_IDSEL3	PCI_AD18	PCI_AD16	PCI_AD15	PCI_AD4
AL	VO2_V	VO2_AVDD_V	VO2_AVSS_V	SO0_DATA5	SO1_DATA5	SO1_DATA4	SI0_LRCLK	SI1_BCLK	PCI_REQ0# GNT#	PCI_AD28	PCI_AD24	PCI_IDSEL1	PCI_AD20	PCI_FRAME#	PCI_TRDY#	PCI_AD13	PCI_AD11
AM	VO2_U	VO2_AVDD_U	VO2_AVSS_U	SO0_DATA4	SO1_SPDIF	SO1_DATA2	SI0_SPDIF	SI1_DATA	PCI_GNT3#	PCI_GNT2#	PCI_AD30	PCI_AD26	PCI_IDSEL0	PCI_AD22	PCI_IRDY#	PCI_PAR	PCI_AD12
AN	SO0_SPDIF	SO0_LRCLK	SO0_DATA2	SO0_DATA3	SO1_BCLK	SO1_DATA3	SI0_BCLK	PCI_INTA#	PCI_GNT1#	PCI_AD29	PCI_AD25	PCI_AD23	PCI_AD21	PCI_CBE2#	PCI_STOP#	PCI_AD14	PCI_AD10
AP	NC	SO0_MCLK	SO0_BCLK	SO0_DATA1	SO1_MCLK	SO1_DATA1	SI0_DATA	PCI_CLK	PCI_GNT0# REQ#	PCI_AD31	PCI_AD27	PCI_CBE3#	PCI_AD19	PCI_AD17	PCI_DEVSEL#	PCI_CBE1#	PCI_AD8

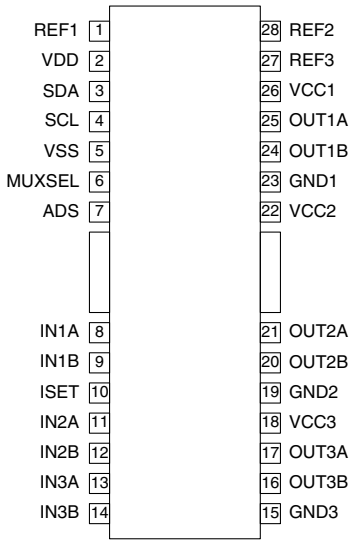
● Bottom Right Quadrant

VSS	VSS	VSS	VSS							VSS	VSS	DRAM0_A6	DRAM0_A5	DRAM0_A2	DRAM0_A1	DRAM0_A0	V
VSS	VSS	VSS	VSS							VDD_1V2	VSS	DRAM0_A4	DRAM0_A3	NC	NC	NC	W
VSS	VSS	VSS	VSS							VDD_1V2	VSS	NC	NC	NC	NC	NC	Y
VSS	VSS	VSS	VSS							VSS	VDD_3V3	NC	NC	NC	NC	NC	AA
										VSS	VDD_3V3	TDMX_GPIO0	TDMX_GPIO1	TS1_IN_SYNC	TS1_IN_D1	NC	AB
										VDD_1V2	VSS	TS1_IN_VLD	TS1_IN_D6	TS1_IN_D4	TS1_IN_D2	TS1_CLK	AC
										VDD_1V2	VSS	TS0_IN_VLD	TS1_IN_D7	TS1_IN_D5	TS1_IN_D3	TS1_IN_D0	AD
										VSS	VDD_3V3	TS0_IN_D6	TS0_IN_D4	TS0_IN_D2	TS0_IN_D0	TS0_IN_SYNC	AE
										VSS	VDD_3V3	TS0_IN_D7	TS0_IN_D5	TS0_IN_D3	TS0_IN_D1	TS0_CLK	AF
										VDD_1V2	VSS	PB_ALE	PB_CS3#	PB_CS2#	PB_CS1#	PB_CS0#	AG
VSS	VDD_1V2	VDD_1V2	VSS	VSS	VDD_1V2	VDD_1V2	VSS	VSS	VDD_1V2	VSS	VDD_3V3	PB_DIR#	PB_AD11	PB_AD10	PB_AD	PB_AD	A
VDD_3V3	VSS	VSS	VDD_3V3	VDD_3V3	VSS	VSS	VDD_3V3	VDD_3V3	VSS	VDD_3V3	VSS	PB_A6	PB_AD15	PB_AD14	PB_AD13	PB_AD12	A
PCI_AD6	PCI_AD2	S B20_VSSAT_0	SB2 0_VSSAT_0	SB2 0_VSSAT_1	S B20_VSSAT_1	RTC_VSS	NC	NC	NC	NC	PB_A12	PB_A7	PB_AD3	PB_AD2	PB_AD1	PB_AD0	AK
PCI_CBE0#	PCI_AD0	S B20_VSSAT_0	SB2 0_VSSAC	SB2 0_VDDAC_3V3	S B20_VSSAT_1	RTC_VDD_BAT_3V3	RTC_VDD_BAT_3V3	NC	PB_A21	PB_A17	PB_A13	PB_A	PB_AD7	PB_AD6	PB_AD5	PB_AD4	AL
PCI_AD	PCI_AD3	S B20_VDDAT_0_3V3	SB2 0_VDDAT_0_3V3	SB2 0_VDDAT_1_3V3	S B20_VDDAT_1_3V3	RTC_RING	RTC_TEST	NC	PB_A22	PB_A1	PB_A14	PB_A	PB_A3	PB_A0	PB_DMAACK#	PB_RD#	AM
PCI_AD7	PCI_AD1	S B20_REXT	SB 20_DP_0	SB2 0_DP_1	S B20_ATEST	RTC_CLK_IN	RTC_XTAL_DISC	NC	PB_A23	PB_A1	PB_A15	PB_A10	PB_A4	PB_A1	PB_DMARQ	PB_WR#	AN
PCI_AD5	SB2 0_XO	S B20_XI	SB 20_DM_0	SB 20_DM_1	RTC_CLK_O T	RTC_XTAL_IN	RTC_XTAL_O T	NC	PB_A24	PB_A20	PB_A16	PB_A11	PB_A5	PB_A2	PB_IORDY	NC	AP
1	1	20	21	22	23	24	25	26	27	2	2	30	31	32	33	34	

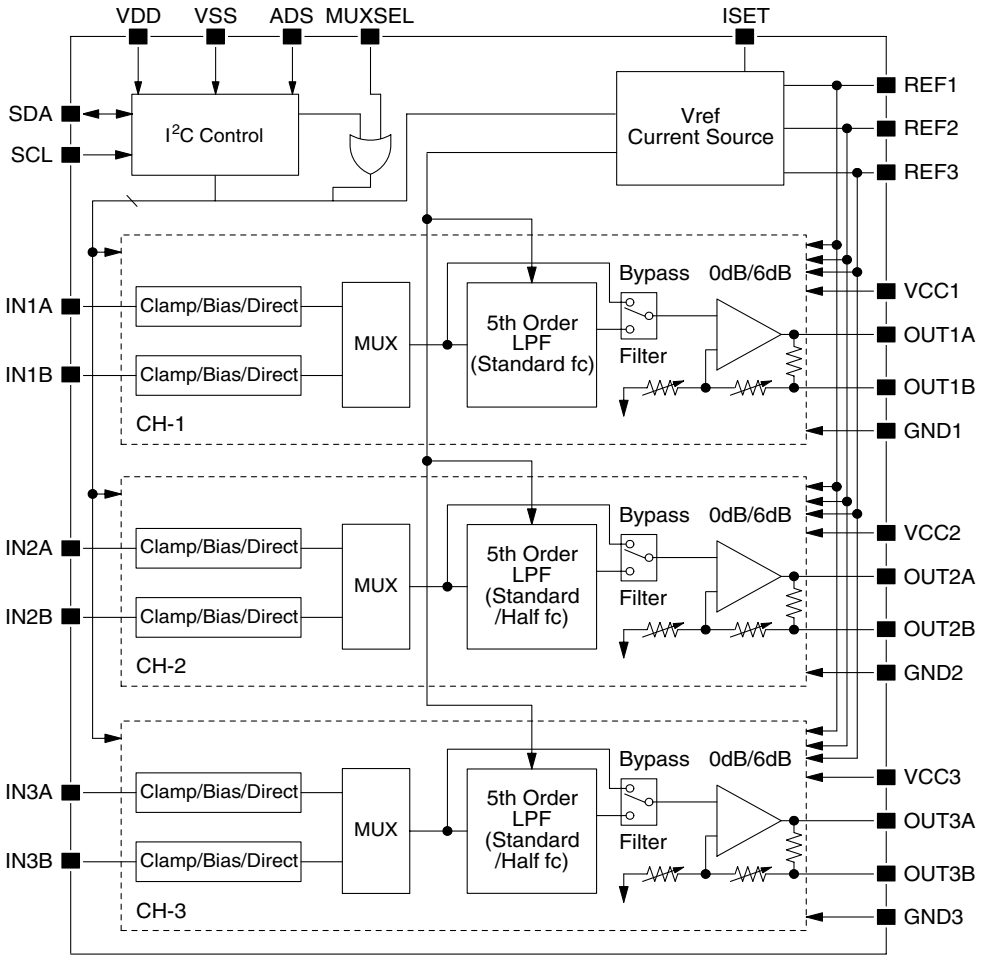
■ SM5302AS (IC4201)

• HD VIDEO AMP

● Pin Arrangement (Top view)



● Block Diagram



● Pin Function

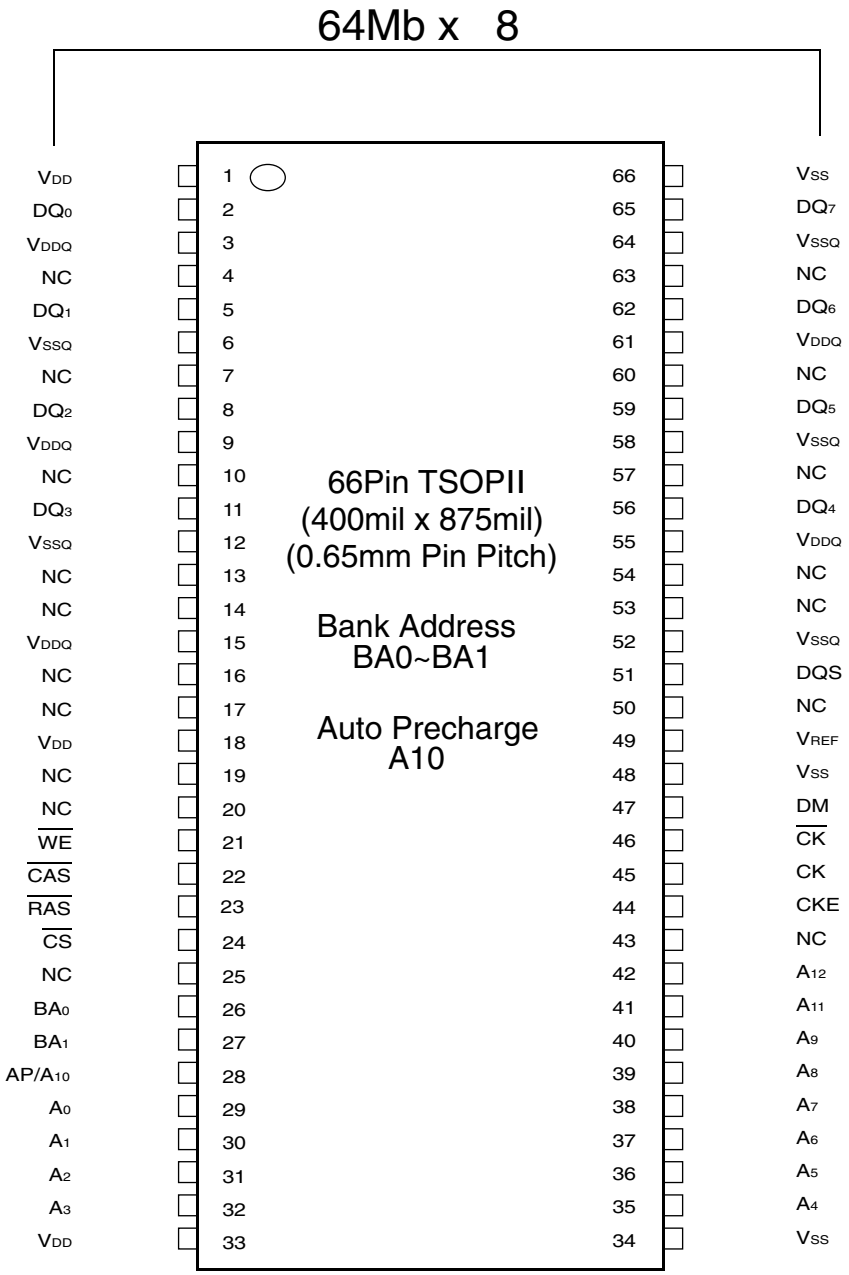
No.	Pin Name	I/O *1	A/D *2	Pin Function
1	REF1	O	A	Internal reference voltage 1
2	VDD	–	D	Digital power supply (3.0 V to 5.5 V)
3	SDA	I/O	D	I2C data signal input/output
4	SCL	I	D	I2C clock signal input
5	VSS	–	D	Digital ground
6	MUXSEL	I	D	Input multiplexer switching pin
7	ADS	I	D	I2C slave address setting pin (3 state)
8	IN1A	I	A	Video signal input (CH-1, A input)
9	IN1B	I	A	Video signal input (CH-1, B input)
10	ISET	–	A	Resistor connection pin for internal current setting (RISET normal 1.8k ohm)
11	IN2A	I	A	Video signal input (CH-2, A input)
12	IN2B	I	A	Video signal input (CH-2, B input)
13	IN3A	I	A	Video signal input (CH-3, A input)
14	IN3B	I	A	Video signal input (CH-3, B input)
15	GND3	–	A	Analog ground (CH-3)
16	OUT3B	O	A	Video signal output (CH-3, for Sag correction)
17	OUT3A	O	A	Video signal output (CH-3)
18	VCC3	–	A	Analog power supply (CH-3) (4.75 V to 5.25 V)
19	GND2	–	A	Analog ground (CH-2)
20	OUT2B	O	A	Video signal output (CH-2, for Sag correction)
21	OUT2A	O	A	Video signal output (CH-2)
22	VCC2	–	A	Analog power supply (CH-2) (4.75 V to 5.25 V)
23	GND1	–	A	Analog ground (CH-1, Vref)
24	OUT1B	O	A	Video signal output (CH-1, for Sag correction)
25	OUT1A	O	A	Video signal output (CH-1)
26	VCC1	–	A	Analog power supply (CH-1, Vref) (4.75 V to 5.25 V)
27	REF3	O	A	Internal reference voltage 3
28	REF2	O	A	Internal reference voltage 2

*1: I: Input, O: Output
*2: A: Analog, D: Digital

K4H510838C (IC2001, 2021, 2901, 2921)

• DDR MEMORY

● Pin Arrangement (Top view)

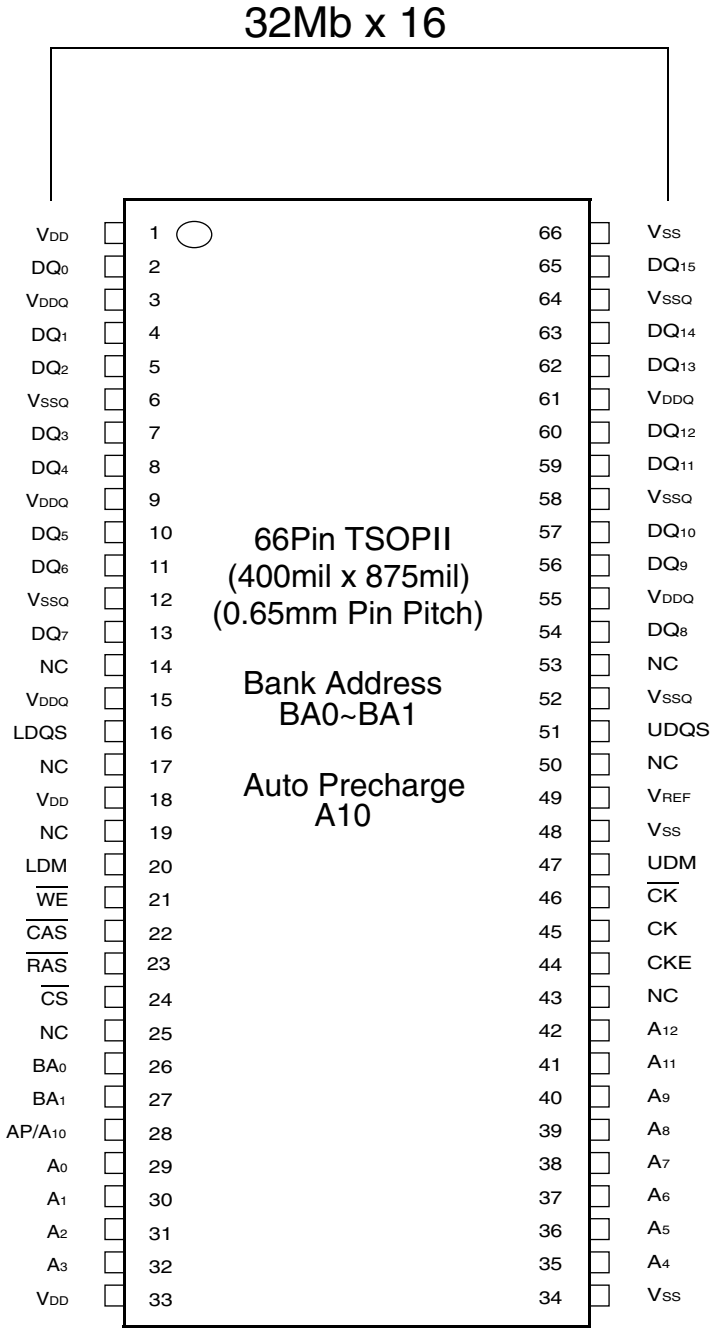


512Mb TSOP-II Package Pinout

■ K4H511638C (IC2101, 2121)

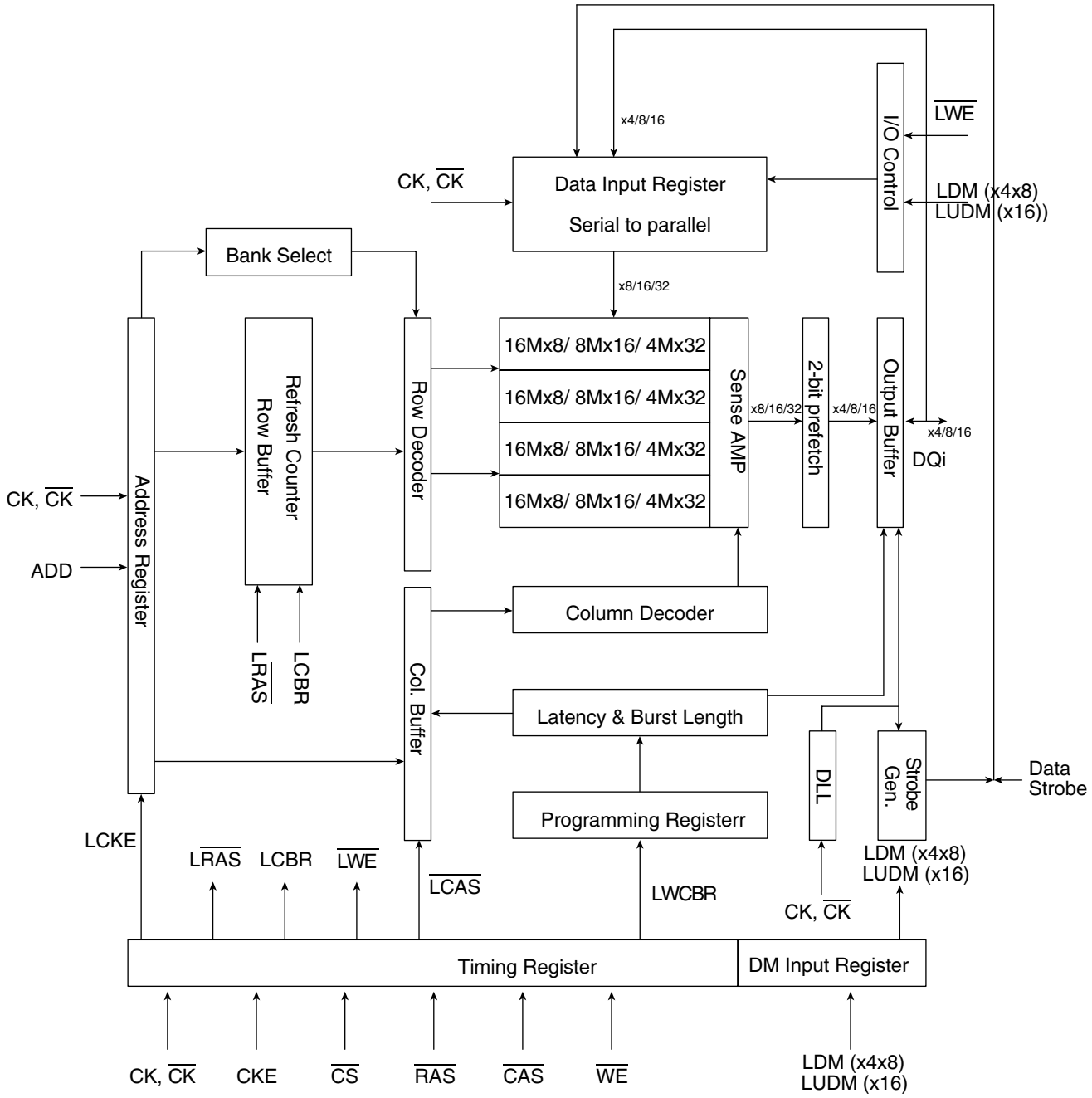
• DDR MEMORY 32x16

● Pin Arrangement (Top view)



512Mb TSOP-II Package Pinout

● Block Diagram



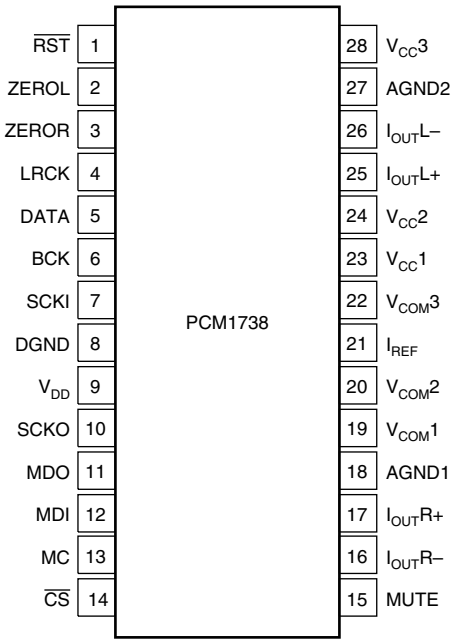
● **Pin Function**

SYMBOL	TYPE	DESCRIPTION
CK, $\overline{CK}$	Input	Clock : CK and $\overline{CK}$ are differential clock inputs. All address and control input signals are sampled on the positive edge of CK and negative edge of $\overline{CK}$. Output (read) data is referenced to both edges of CK. Internal clock signals are derived from CK/$\overline{CK}$.
CKE	Input	Clock Enable : CKE HIGH activates, and CKE LOW deactivates internal clock signals, and device input buffers and output drivers. Taking CKE Low provides PRECHARGE POWER-DOWN and SELF REFRESH operation (all banks idle), or ACTIVE POWER-DOWN (row ACTIVE in any bank). CKE is synchronous for POWER-DOWN entry and exit, and for SELF REFRESH entry. CKE is asynchronous for SELF REFRESH exit, and for output disable. CKE must be maintained high throughput READ and WRITE accesses. Input buffers, excluding CK, $\overline{CK}$ and CKE are disabled during POWER-DOWN. Input buffers, excluding CKE are disabled during SELF REFRESH. CKE is an SSTL_2 input, but will detect an LVCMOS Low level after Vdd is applied upon 1st power up, After V_{REF} has become stable during the power on and initialization sequence, it must be maintained for proper operation of the CKE receiver. For proper SELF-REFRESH entry and exit, V_{REF} must be maintained to this input.
$\overline{CS}$	Input	Chip Select : $\overline{CS}$ enables(registered LOW) and disables(registered HIGH) the command decoder. All commands are masked when $\overline{CS}$ is registered HIGH. $\overline{CS}$ provides for external bank selection on systems with multiple banks. $\overline{CS}$ is considered part of the command code.
$\overline{RAS}$, $\overline{CAS}$, $\overline{WE}$	Input	Command Inputs : $\overline{RAS}$, $\overline{CAS}$ and $\overline{WE}$ (along with $\overline{CS}$) define the command being entered.
LDM,(UDM)	Input	Input Data Mask : DM is an input mask signal for write data. Input data is masked when DM is sampled HIGH along with that input data during a WRITE access. DM is sampled on both edges of DQS. Although DM pins are input only, the DM loading matches the DQ and DQS loading. For the x16, LDM corresponds to the data on DQ0~D7 ; UDM corresponds to the data on DQ8~DQ15. DM may be driven high, low, or floating during READs.
BA0, BA1	Input	Bank Addres Inputs : BA0 and BA1 define to which bank an ACTIVE, READ, WRITE or PRECHARGE command is being applied.
A [0 : 12]	Input	Address Inputs : Provide the row address for ACTIVE commands, and the column address and AUTO PRECHARGE bit for READ/WRITE commands, to select one location out of the memory array in the respective bank. A10 is sampled during a PRECHARGE command to determine whether the PRECHARGE applies to one bank (A10 LOW) or all banks (A10 HIGH). If only one bank is to be precharged, the bank is selected by BA0, BA1. The address inputs also provide the op-code during a MODE REGISTER SET command. BA0 and BA1 define which mode register is loaded during the MODE REGISTER SET command (MRS or EMRS).
DQ	I/O	Data Input/Output : Data bus
LDQS,(U)DQS	I/O	Data Strobe : Output with read data, input with write data. Edge-aligned with read data, centered in write data. Used to capture write data. For the x16, LDQS corresponds to the data on DQ0~D7 ; UDQS corresponds to the data on DQ8~DQ15
NC	-	No Connect : No internal electrical connection is present.
VDDQ	Supply	DQ Power Supply : +2.5V ± 0.2V. (+2.6V ±0.1V for DDR400)
VSSQ	Supply	DQ Ground.
VDD	Supply	Power Supply : +2.5V ± 0.2V. (+2.6V ±0.1V for DDR400)
VSS	Supply	Ground.
VREF	Input	SSTL_2 reference voltage.

■ PCM1738EG-3 (IC3001, 3401, 3501)

• DIGITAL-TO-ANALOG CONVERTER

● Pin Arrangement (Top view)

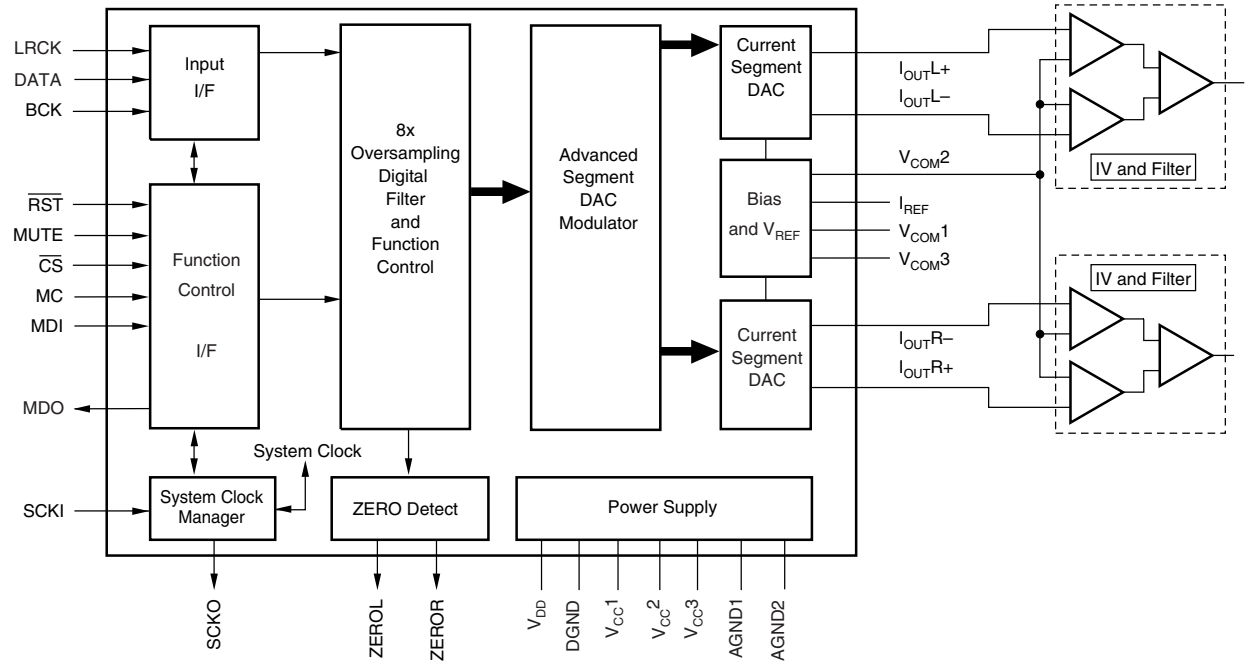


● Pin Function

PIN	NAME	TYPE	FUNCTION
1	$\overline{RST}$	IN	Reset(1)
2	ZEROL	OUT	Zero Flag for L-Channel.
3	ZEROR	OUT	Zero Flag for R-Channel.
4	LRCK	IN	Left/Right clock (f_S) input for normal operation.(1) WDCK clock input in external DF mode. Connected to GND in DSD mode.
5	DATA	IN	Serial Audio data input for normal operation.(1) L-channel audio data input for external DF and DSD modes.
6	BCK	IN	Bit Clock. Input. Connected to GND for DSD mode.(1)
7	SCKI	IN	System Clock Input for normal operation.(1) BCK ($64f_S$) clock input for DSD mode.
8	DGND	–	Digital Ground
9	V_{DD}	–	Digital Supply, +3.3V
10	SCKO	OUT	System Clock Output
11	MDO	OUT	Serial data output for function control register.(2)
12	MDI	IN	Serial data input for function control register.(1)
13	MC	IN	Shift Clock for function control register.(1)
14	$\overline{CS}$	IN	Mode Control chip select and latch signal.(1)
15	MUTE	IN	Analog output mute control for normal operation.(1) R-channel audio data input for external DF and DSD modes.
16	$I_{OUT}R–$	OUT	R-Channel Analog Current Output –
17	$I_{OUT}R+$	OUT	R-Channel Analog Current Output +
18	AGND1	–	Analog Ground
19	$V_{COM}1$	–	Internal Bias Decoupling Pin
20	$V_{COM}2$	–	Common Voltage for I/V
21	I_{REF}	–	Output current reference bias pin. Connect 16k resistor to GND.
22	$V_{COM}3$	–	Internal Bias Decoupling Pin
23	$V_{CC}1$	–	Analog Supply, +5.0V
24	$V_{CC}2$	–	Analog Supply, +5.0V
25	$I_{OUT}L+$	OUT	L-Channel Analog Current Output +
26	$I_{OUT}L–$	OUT	L-Channel Analog Current Output –
27	AGND2	–	Analog Ground
28	$V_{CC}3$	–	Analog Power Supply, +5.0V

NOTES: (1) Schmitt-trigger input, 5V tolerant. (2) Tristate output.

● Block Diagram



7.4 DISC / CONTENT FORMAT PLAYBACK COMPATIBILITY

BD-ROM playback

Blu-ray Disc is a next-generation video disc format featuring far higher disc capacity than conventional DVD. The higher capacity makes a whole range of new and enhanced features possible, such as support for high-definition video up to 1920 x 1080 pixels, high quality, surround sound audio, greater interactivity and richer content.

BD-ROM discs are commercially produced discs (Video Distribution format) that can contain movie and other video content, interactive content, enhanced menu features such as pop-up menus (press **MENU** during playback for these), full-color, high-definition animated buttons and animated menu transition effects, button sounds (sounds are played when menu buttons are selected or activated), high-definition bitmap subtitles supporting full-color images with frame-accurate animation effects up to full video frame rate, and so on.

While BD capacity is enough for most applications, the BD-ROM standard allows for content to be spread across several discs, removing the limit of one physical disc. Follow the on-screen instructions during playback when using these special kinds of discs.

BD-J application

The BD-ROM specification supports Java for interactive content. The Java specification for BD-ROM is known as BD-J. This allows content providers to put games and other interactive material linked to specific titles on to BD-ROM discs. (This player does not support downloadable BD-J content, direct connection to the Internet or the retrieval of content through the Internet.)

HDMI digital interface

The HDMI (High Definition Multimedia Interface) interconnect provides high quality digital audio and video, all from a single user-friendly connector. HDMI is the first consumer electronics interface to support uncompressed standard, enhanced, or high-definition video plus standard to multi-channel surround sound audio, all using one interface. You can easily connect to an HDMI-equipped AV receiver or audio-visual device for high quality audio and video.

1080/60p and 1080/24p video output

This player supports a variety of video output resolutions, up to 1080 lines/60 frames per second, progressive (HDMI only), making it ideal for playing high-definition Blu-ray Discs.

Pure Cinema

There are two types of video signals: Video material, with a frame rate of 30 frames/second; and film material, that has a frame rate of 24 frames/second.

In PureCinema mode film material is converted to 60 frames/second progressive for an exceptionally clear picture.

High quality audio

Blu-ray supports DTS, DTS-HD (DTS-HD is played back as DTS), Dolby Digital, Dolby Digital Plus, Dolby TrueHD (Dolby Digital Plus and Dolby TrueHD are played back as Dolby Digital) and Linear PCM audio in up to eight channels (up to two channels for 24-bit/192 kHz audio). Connect this player to a surround-sound AV receiver for a true home theater experience.

Disc/content format playback compatibility

General disc compatibility

This player is compatible with a range of disc types (media) and formats. Compatible discs will usually feature one of the following logos on the disc and/or disc packaging. Note however that some disc types, such as recordable DVD or BD, may be in an unplayable format—see below for further compatibility information.

Blu-ray Disc (BD)

DVD-Video **DVD-R** **DVD-R DL** **DVD-RW**

- "Blu-ray Disc" and are trademarks.
- is a trademark of DVD Format/Logo Licensing Corporation.
- This player may not be able to play perfectly every disc that features one of the logos listed above. Please contact Pioneer if you find a disc that won't play properly.

Important

- This player is not compatible with BD-R/RE, DVD-R/RW (VR mode), DVD-Audio, DVD-RAM, CDs or disc types other than those listed above.
- This player is only compatible with NTSC discs.
- Do not use 8 cm disc adapters with this player. 8 cm discs can be played directly by placing then in the 8 cm disc depression in the center of the disc tray.

BD-ROM compatibility

- BD-ROM discs should conform to the BD-ROM Profile1.
- If a disc containing DTS-HD Bitstream audio is played, this player is only compatible with bitstream output or playback decoding of current DVD (DTS) material (sampling rate: 48 kHz max., 5.1 ch.).
- If a disc containing Dolby Digital Plus or Dolby TrueHD audio is played, this player is only compatible with bitstream output or playback decoding of current DVD (Dolby Digital) material.
- This player cannot play 8 cm BD-ROM discs.

DVD-R/RW compatibility

- This player is compatible with DVD-R/RW discs recorded in DVD-Video format.
- DVD-R/RW discs containing PC data can also be played. See below for file compatibility.
- Unfinalized DVD-R/RW discs and VR mode DVD-R/RW discs cannot be played in this player.

PC-created disc compatibility

Discs recorded using a personal computer may not be playable in this unit due to the settings of the application software used to create the disc. Check with the software publisher for more detailed information.

DualDisc playback

A DualDisc is a new two -sided disc, one side of which contains DVD content –video, audio, etc. –while the other side contains non-DVD content such as digital audio material.

The DVD side of a DualDisc will play in this product (excluding any DVD-Audio content).

The non-DVD, audio side of the disc is not compatible with this player.

It is possible that when loading or ejecting a DualDisc, the opposite side to that being played will be scratched. Scratched discs may not be playable.

For more detailed information on the DualDisc specification, please refer to the disc manufacturer or disc retailer.

Disclaimer Notice

This Blu-ray Disc player is not designed to play and cannot play the DVD portion of a hybrid disc.

File compatibility

- Compatible media: DVD-R, DVD-RW, media server on network (some formats may not be supported depending on the media server type).
- Even when they are in a supported format, some files may not play or display depending on the content.
- Even when playing a supported format, some functions may not operate properly depending on the content.

Video file compatibility

- **Windows Media Video (WMV)**
  – WMV HD is supported
- **MPEG-2 (PS/TS)**
  – MP@HL
- **MPEG-1**

Audio file compatibility

- **Windows Media Audio (WMA)**
  – WMA9 (including variable bit-rate (VBR)), WMA9 Pro (up to 5.1 ch) are supported. WMA9 Voice and WMA Lossless are not supported
  – Sampling rates: up to 44.1kHz or 48 kHz (including WMA9 Pro)
  – Bit rate: up to 192 kbps (WMA constant bit-rate (CBR));
  up to 384 kbps (WMA9 variable bit-rate (VBR));
  up to 768 kbps (WMA9 Pro)
- **MPEG-1 Audio Layer 3 (MP3)**
  – Variable bit-rate (VBR) is supported
  – Sampling rates: up to 32kHz, 44.1kHz or 48 kHz
  – Bit rate: up to 320 kbps
- **WAVE (Linear PCM)**
  – Sampling rates: up to 44.1kHz or 48 kHz

Image file compatibility

- **JPEG**
  – Baseline JPEG and progressive JPEG/Exif are supported
  – Resolution: up to 4096 x 4096 pixels
- **PNG**
  – Resolution: up to 4096 x 4096 pixels
- **GIF**
  – Resolution: up to 4096 x 4096 pixels

File extensions

The following file extensions should be used with this player:

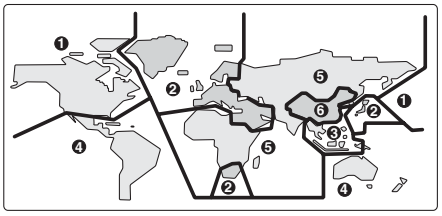
- **Video**
  .wmv .mpg .mpeg
- **Audio**
  .wma .mp3 .wav
- **Image**
  .jpg .jpeg .png .gif

Even when files have a supported file extension, some files may not play or display depending on the content or media server type.

DVD-Video regions

All commercially produced DVD movies (DVD-Video discs) carry a region mark on the case somewhere that indicates which region(s) of the world the disc is compatible with. This player also has a region mark, which you can find on the rear panel. Discs from incompatible regions will not play in this player. Discs marked **ALL** will play in any player.

The diagram below shows the various DVD regions of the world.



BD-ROM regions

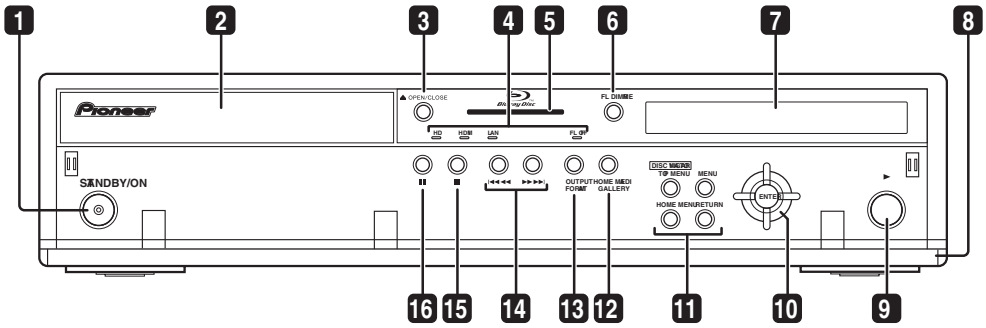
Like DVD movies, BD movie discs (BD-ROM) also carry a region mark that indicates which region(s) of the world the disc is compatible with. This player also has a region mark, which you can find on the rear panel. Discs from incompatible regions will not play in this player. Discs marked **ALL** will play in any player.

The diagram below shows the various BD-ROM regions of the world.

8. PANEL FACILITIES

Controls and displays

Front panel



1 ⏻ STANDBY/ON
Press to switch the player on (the power indicator lights blue when the power is on) or into standby.

2 Disc tray

3 ⏏ OPEN/CLOSE
Press to open or close the disc tray.

4 Indicators
- **HD** – Lights when the video output is 720p, 1080i or 1080p (HDMI), or 720p or 1080i (component).
- **HDMI** – Lights when an HDCP device is connected via HDMI.
- **LAN** – Lights when there is an active local area network (LAN) connection.
- **FL OFF** – Lights when the display and other indicators are switched off.

5 Blu-ray indicator
Lights when a BD disc is loaded.

6 FL DIMMER
Press to change the brightness of the display. When the display and other indicators are off, the **FL OFF** indicator (see above) lights.

7 Display
Shows disc status and playback information.

8 Flip-down cover

9 ►
Press to start or resume disc playback.

10 ↑/↓/←/→ and ENTER
Use to navigate on-screen menus.

11 Menu navigation buttons
- **MENU** – BD-ROM: Press to display/hide the pop-up menu. DVD-Video: Press to display the disc menu (if there is one).
- **RETURN** – Press to return to a previous screen.
- **DISC NAVIGATOR** / **TOP MENU** – Press to display the top menu of a BD-ROM or DVD-Video disc. When playing a DVD-R/RW or BD-R/RE disc, press to display/exit the Disc Navigator.
- **HOME MENU** – Press to display the player's Home Menu, from which you can access most of the player's functions.

12 HOME MEDIA GALLERY
Press to access the Home Media Gallery screen.

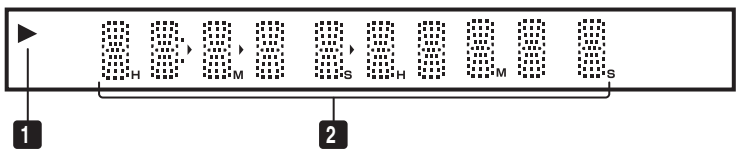
13 OUTPUT FORMAT
Press to switch the output format over HDMI and component video outputs. See *Changing the video output format* .

14 Skip/scan buttons
- **►►►►I**–Press to jump to the next chapter, track, etc. Press and hold for fast forward scanning
- **I◄◄◄◄**– Press to jump back to the beginning of the current chapter, track, etc. then to previous chapters, tracks, etc. Press and hold for fast reverse scanning.

15 ■
Press to stop the disc (you can resume playback by pressing ►(play)).

16 II
Press to pause playback. Press again to restart.

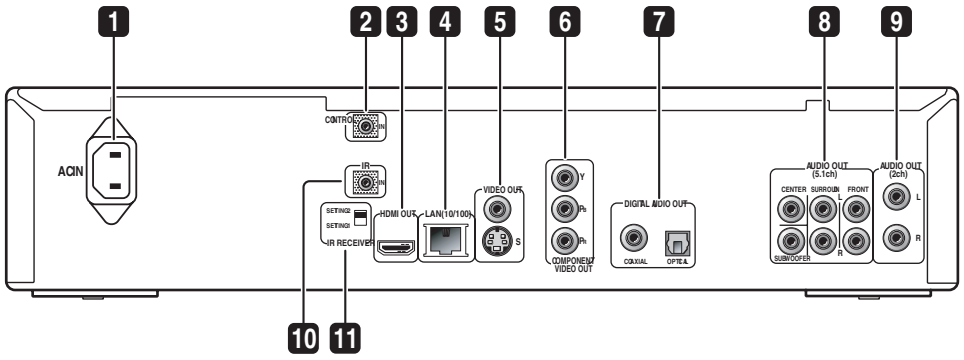
Front panel display



1 ►
Lights during playback of a disc or file.

2 Character display
Shows various playback information—disc time, chapter and title number, etc.

Rear panel



1 AC IN
Connect the supplied power cord here, then plug into a power outlet.

2 CONTROL IN
Use to control this player from the remote sensor of another Pioneer component with a **CONTROL OUT** terminal and bearing the SR mark. Connect the **CONTROL OUT** of the other component to the **CONTROL IN** of this player using a mini-plug cord .

3 HDMI OUT
HDMI output providing a high quality interface for digital audio and video .

4 LAN (10/100)
Ethernet port for 10base-T (10 Mbps) or 100base-TX (100 Mbps) network connection .

5 VIDEO and S-VIDEO OUT
Video output (composite) that you can connect to your TV or AV receiver using the supplied video cable .

S-Video output that you can use instead of the **VIDEO OUT** jacks .

6 COMPONENT VIDEO OUT
High quality video output for connection to a TV, monitor or AV receiver that has component video inputs.

Connect using a commercially available three-way component video cable .

7 DIGITAL AUDIO OUT – OPTICAL / COAXIAL
Digital audio outputs for connection to a PCM, Dolby Digital, DTS and/or MPEG-compatible AV receiver .

8 AUDIO OUT (5.1ch)
Multichannel (5.1ch) analog audio outputs for connection to an AV receiver with multichannel analog audio inputs .

9 AUDIO OUT (2ch)
Stereo analog audio outputs for connection to your TV, AV receiver or stereo system .

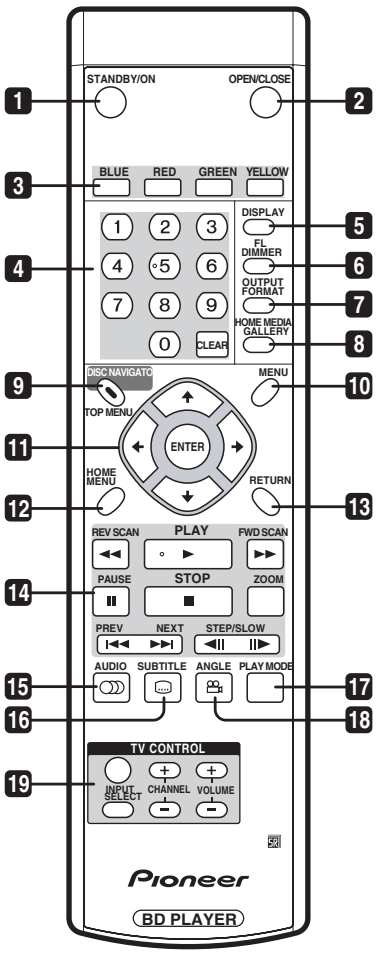
10 IR IN
Jack for an external IR (infrared) remote control receiver .

11 IR RECEIVER switch
Switch to the setting compatible with your external IR remote control receiver .

Tip

- When connecting this player to your TV, AV receiver or other equipment, make sure that all components are **switched off** and **unplugged** .
- Youmay find it useful to have the manuals supplied with your other components handy when connecting this player.

Remote control unit



1 ⏻ STANDBY/ON
Press to switch the player on or into standby.

2 ⏏ OPEN/CLOSE
Press to open or close the disc tray.

3 BLUE / RED / GREEN / YELLOW
Use to navigate BD-ROM menus.

4 Number buttons
Use to enter title, track numbers, etc.

CLEAR : Press to clear a numeric entry, etc.

5 DISPLAY
Press to display information about the disc playing.

6 FL DIMMER
Press to change the brightness of the display. When the display and other indicators are off, the **FL OFF** indicator (see above) lights.

7 OUTPUT FORMAT
Press to switch the output format over HDMI and component video outputs .

8 HOME MEDIA GALLERY
Press to display the Home Media Gallery screen .

9 DISC NAVIGATOR / TOP MENU
Press to display the top menu of a BD-ROM or DVD-Video disc. When playing a DVD-R/RW disc, press to display/exit the Disc Navigator.

10 MENU
BD-ROM: Press to display/hide the pop-up menu.
DVD-Video: Press to display the disc menu (if there is one).

11 ↑, ↓, ←, → and ENTER
Use to navigate on-screen displays and menus. Press **ENTER** to select an option or execute a command.

12 HOME MENU
Press to display the player's Home Menu, from which you can access most of the player's functions.

13 RETURN
Press to return to a previous screen.

14 Playback controls

◄◄ / ►► : Press to start reverse/forward scanning.

► : Press to start or resume playback.

II : Press to pause playback; press again to restart.

■ : Press to stop the disc (you can resume playback by pressing ► (play)).

ZOOM : Press to zoom the screen when displaying a moving or still image .

I◄◄ ►►I : Press to jump to the start of the previous / next chapter / track.

◄II IIA► : Use for slow motion and step frame .

15 AUDIO
Press to select the audio channel or language .

16 SUBTITLE
Press to select a subtitle display .

17 PLAY MODE
Press to change the Play Mode (repeat play, for example).

18 ANGLE
Press to change the camera angle during BD or DVD movie multi-angle scene playback .

During photo slideshow playback, press to rotate the current photo 90° .

19 TV CONTROL buttons
See also Setting up the remote to control your TV .

⏻ : Press ⏻ to turn the TV on or into standby.

VOLUME +/– : Use to adjust the volume.

CHANNEL +/– : Use to select TV channel.

INPUT SELECT: Press to change the input function of the TV.

■ Jigs list

Name	Jig No.	Remarks
Service Remote Control Unit	GGF1381	adjustment, diagnosis
ID Data Disc for Blu-ray player	GGV1306	ID data setting
Extension Cable	GGD1437	Diagnosis of MAIN Assy
Extension Board	GGF1533	Diagnosis of MAIN Assy
DVD Test Disc (DVD-Video)	GGV1025	Check of DVD-Video
Tray Ejection Rod	GGF1529	Diagnosis and Firmwave Update